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BETTER FRUIT

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VOLUME XV JULY, 1920 NUMBER 1

FEATURES IN THIS ISSUE:

Keeping Production Records
Yakima Valley Apple Packing Houses
Preventing Brown Rot in Apricots
The Codling Moth in Walnuts

Brodie D A Comp
Dept of Agriculture

THE BEAUTIFUL COLORING OF FRUIT AS PORTRAYED BY AN ITALIAN ARTIST

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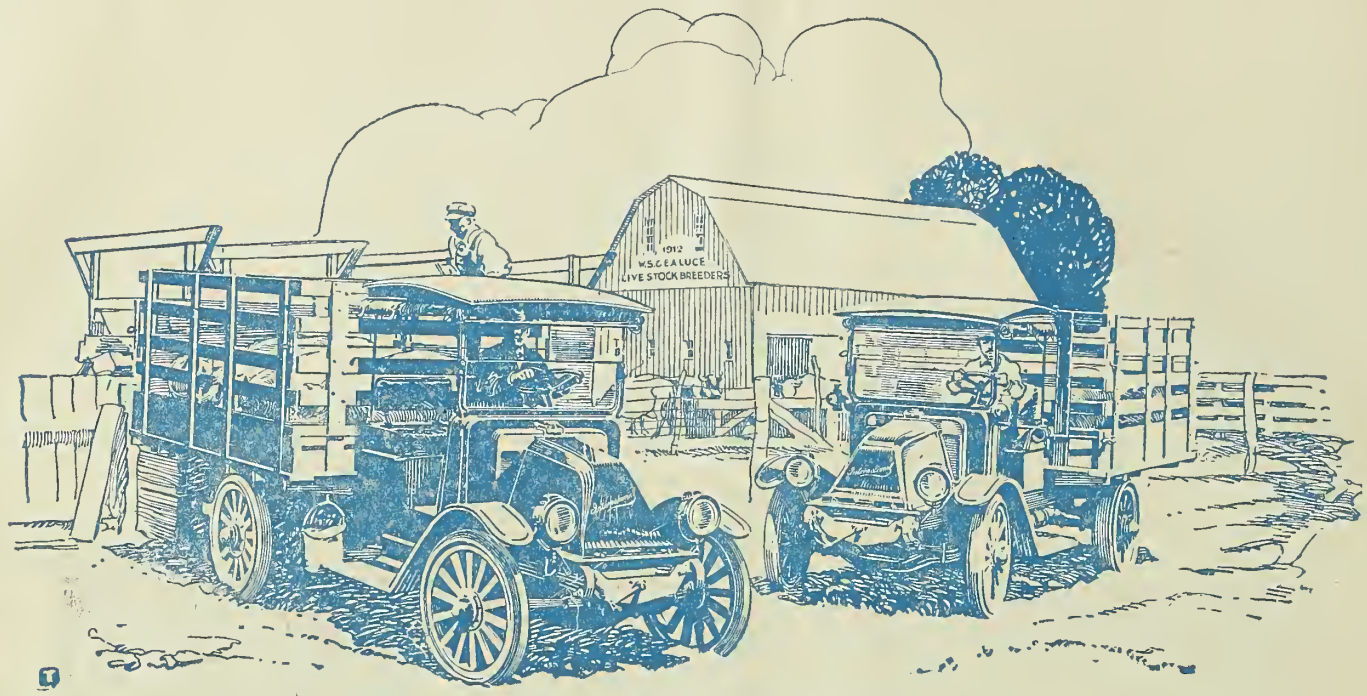

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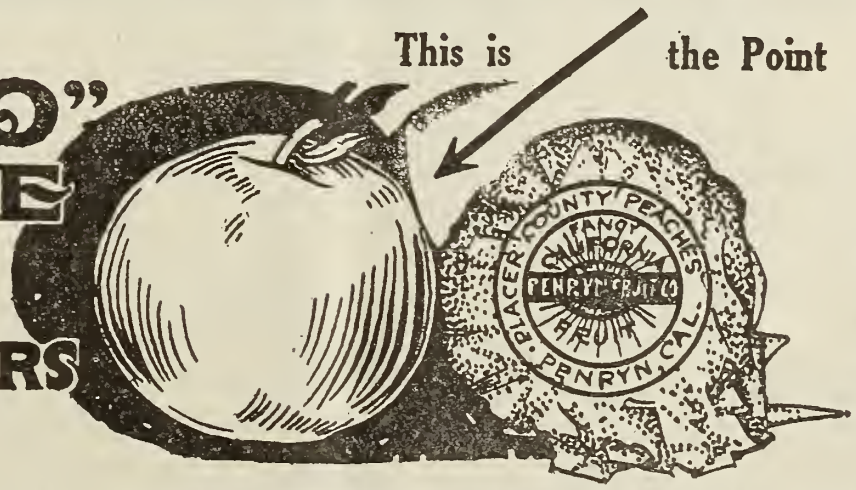

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"Caro" from DessiCARE (to dry up)

"Caro" Prolongs the Life of Fruit Why?

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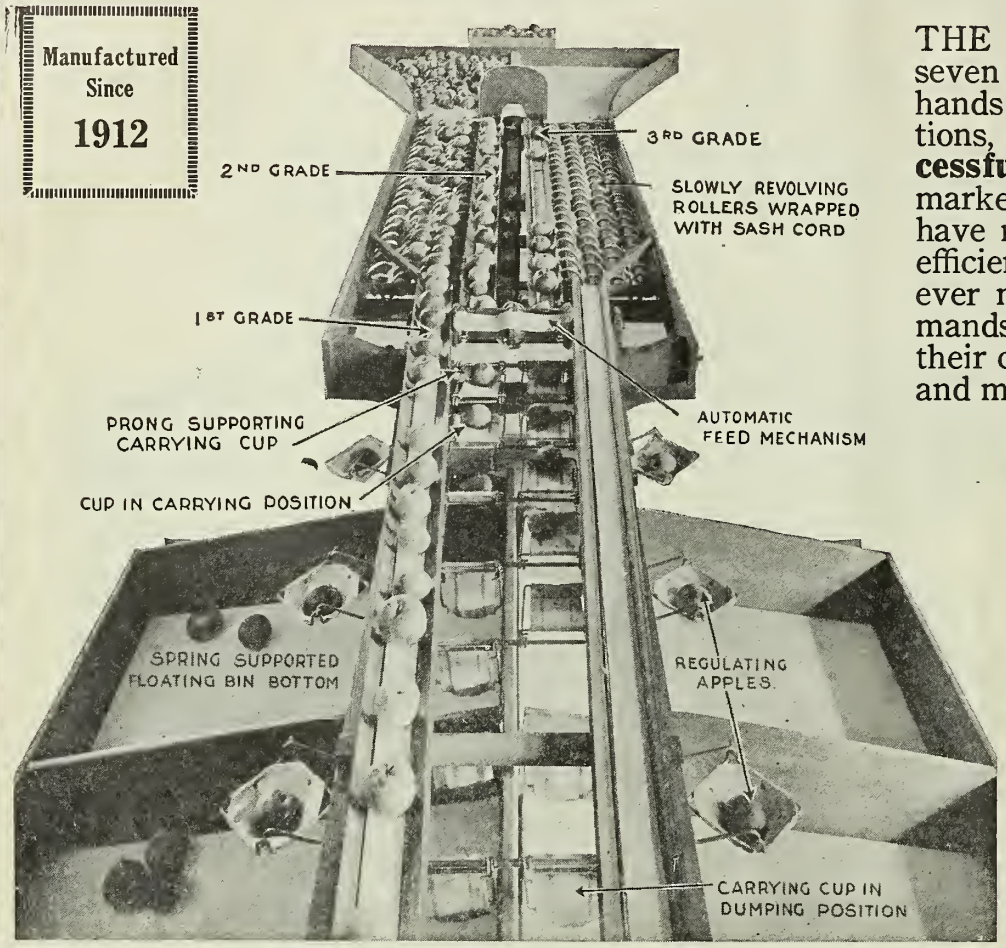

Upper View of a portion of the Four-Section Model for box packing, showing the Mechanical Sorting Table. No hand feeding necessary. The fruit is fed automatically. This table slowly revolves the fruit as it is moved forward before the sorters. Our belt type of sorting table can be furnished if desired.

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New Features

We have perfected two extra attachments to our graders which we are putting out this season, viz:

(1) Off-Grade Return Belts which afford a means for bringing back to the sorters the off-grade fruit found in the bins. This makes an immediate check on the sorters and will result in a better grade of fruit being packed.

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Check the equipment you are interested in.

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Crop expected in 1920.....boxes.

Name .....

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VOLUME XV — PORTLAND, OREGON, JULY, 1920 — NUMBER 1

Keeping Production Records by Growers of Small Fruit

By Wm. E. Schimpf, Secretary Oregon Cranberry Growers' Association

THE keeping of accurate production records has always been a serious problem to the fruit grower. During the exciting period of the harvest the best system is liable to be neglected and thereupon immediately ceases to be a system and becomes an aggravation. Accurate production records are desired by every fruit grower, and the problem has been to secure a system which would be accurate and yet so simple as to be practically automatic.

During the harvest season everything seems to be very much of a mad race. Where up to this time on a cranberry bog one or two people have been employed on a twenty-five acre bog, now a hundred or more are needed. Pickers of all ages, races and creeds assemble to gather the festive little berry. With this army of people we have the same old problems. The fruit grower has a strenuous though not altogether uninteresting time during this exciting period.

Now in order to know what he is doing, he should know what he is producing. It is just as important to the cranberry grower to keep accurate production records as it is to the dairyman. Fruit growing is a business just as much as selling hats. No one would think of engaging in any mercantile business such as selling hats without opening up a set of books. Fruit growers are willing to do this, and have been anxious to have some simple method devised which would really be of assistance to them in the keeping of such accurate records. One advantage the fruit grower has over his fellow business man, and that is he is selling but one commodity.

The average fruit grower is well above the average person in intelligence and it is not from ignorance of their value that precise production records are kept, nor is it from unwillingness. When the end of the harvest day comes the grower feels that he has earned a well deserved rest, and though he knows that he should tabulate the results of his day's work, he is usually so tired physically that the very thought of bookkeeping appalls him.

A system that in itself would be so simple as to keep its own record, was the problem which demanded solution. One of the members of the Oregon Cranberry Growers' Association has devised just such a system. It has been in use by him for three years, and last season was adopted by every member of the association. The dominant feature of the system is the use of consecutively numbered tickets similar to those used in the movies. At the beginning of the picking day it is only necessary to make a memorandum of the opening number for the day, and to record the closing number at night.

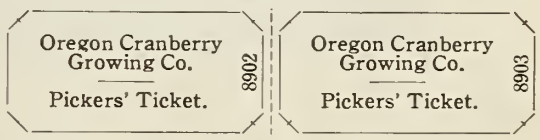
This in itself gives a correct record of the number of boxes picked during the day, and shows what the picking cost should be. The difference between the number on the ticket at the end of the ribbon in the morning and number on the ticket at the end of the ribbon in the evening, must agree with the number of boxes taken from the pickers. Slight discrepancies will occur, and these discrepancies are at once called to the attention of the checker, who gives out the tickets. There can be no dispute, and there is none. An explanation should be had. It will happen that a ticket too many will be given out by the checker, but this fact is immediately recognized by the grower.

Checkers really like the system, for they know that their work is automatically audited. Not only is this system a perfect check upon the person giving out the tickets, but it can be used as a check upon the picker as well. One bright young lady who was giving out tickets for a Clatsop cranberry grower, would always ask to see all of the tickets of the picker whenever the question arose as to whether a ticket had been given for the last box or not. An examination of the tickets usually showed one ticket with a number just preceding the one on the ticket roll, and the picker was satisfied.

Pickers' tickets can be obtained from the moving picture supply houses, they are printed in various colors, and can be had with the name of the grower, the denomination and of course the serial number. Stores in the immediate locality are glad to cash these tickets, as they bring business to their places of business. Later the grower takes them from the storekeeper in lots, issuing his check for this purpose. If such an arrangement can be made it is of decided value to the grower, as it will mean that he must keep but little cash on hand.

Sometimes it is advisable to furnish some store with a working capital of a sufficient amount so that the storekeeper will not have to use too much of his own funds. From time to time as the tickets come in to the store they can be taken up by the grower in good sized lots. This system has the advantage of keeping the picking money distinct and separate from the grower's own cash. Every grower realizes the difficulty in keeping his own money distinct from the picking money during the rush of the harvesting season. The grower usually gets all of his wife's spare change, as well as his children's savings into his harvest fund before he realizes it.

With a system of serially numbered tickets, the difference between the first number of the season and the number left on the ribbon at the end of the season, indicates the exact number of boxes picked during the season. This at once shows him his harvesting cost, that is, it shows him exactly how much money he is to pay out for fruit picked. Tickets used by the cranberry growers are like the cut below.



In connection with these tickets a daily report sheet is used by the cranberry growers of Clatsop County. This report has a space for recording the first ticket given out in the morning, and the last in the evening, a check in the way of the actual count of the number of boxes taken into the warehouse. Distribution of the costs of picking, trucking, checking and other harvesting costs can be made on this daily sheet if it is so desired.

Practically this same sheet is used for the season's report. To make out a report for the entire season will take but little longer than to make out the daily report. The tickets given out by the checker to the pickers have kept right on numbering themselves throughout the entire season, and it is but a matter

of simple subtraction to determine the whole number of boxes harvested for the season. In fact a season's report can be made out and has been made out in fifteen minutes.

The report is really in two parts, one part on which the statistical records are kept, as has just been described above, while the other part of the report sheet is a diagramatic representation of the bog itself, on which the particular section being picked that day is shaded, and such other remarks made which will be of interest to the grower in the years to come. The purpose being to give the proper production credit to those particular sections of the marsh which so deserve the credit. This being very much in the same manner as the dairyman tries to give every cow her proper credit.

The advantage of this can be readily seen. To illustrate, during the past season one Clatsop cranberry grower, who had kept accurate production records of his marsh for the preceding year, was able to estimate his entire crop to a surprising degree of accuracy after picking a single acre. The variation between his estimate and the crop actually picked being about one per cent.

The use of this system is strongly recommended to every grower of small fruit, where the picker is paid by the piece. The system is not theoretical, but is intensely practical. Its results are final and absolute. The numbering on the tickets is as accurate as an adding machine's computations. It is simplicity itself and will be found not only interesting but fascinating as well.

Below is a daily report as taken from one of the picking days during the cranberry harvesting season:

The use of the numbered tickets will well repay the grower as against the old method of using the same tickets over and over again. The tickets should be used but once and destroyed. Their cost is but slight, and their use so very satisfactory, that once the grower uses them, he will never go back to any other system. Should the grower use only the tickets and not the daily report sheets, he will have at least accurately kept the number of units of his fruit, whether boxes, measures or carriers, for the entire season, and this information is worth the price of the tickets many times over.

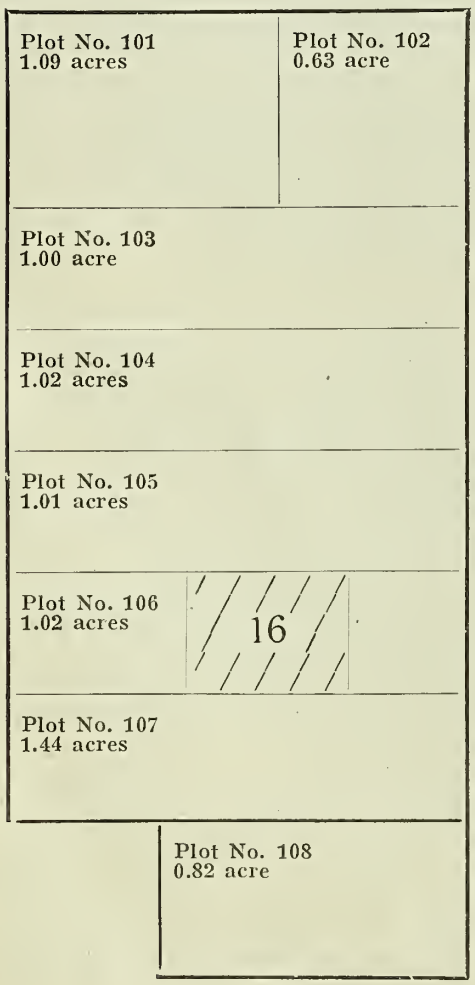
Specially printed tickets can be had in rolls of 2000 tickets each. The larger the lot ordered the better the price. A grower should estimate his needs for some years to come and order enough to cover his needs for several years. In this way his ticket cost will be but little each year. Five dollars would supply tickets enough for a very large crop. Five dollars would not be too much to pay for a bookkeeper that would keep exact count of the total number of tickets given out throughout the entire season. The movie people have been awake to the value of this ticket and have used it for several years, and the mere fact that these successful business men use them universally, should be sufficient recommendation as to their value. We have no doubt but that the fruit grower will be using them just as universally within a short time.

Controlling the Cherry Fruit Fly

Cherry growers who have been the victims of the destructive work of the cherry fruit fly, an insect that heretofore has baffled the efforts of experts to combat it will be interested in knowing that A. B. Black, assistant entomologist at the Oregon Agricultural College Experiment Station after a study of this pest extending over a considerable period is able to give methods for its control.

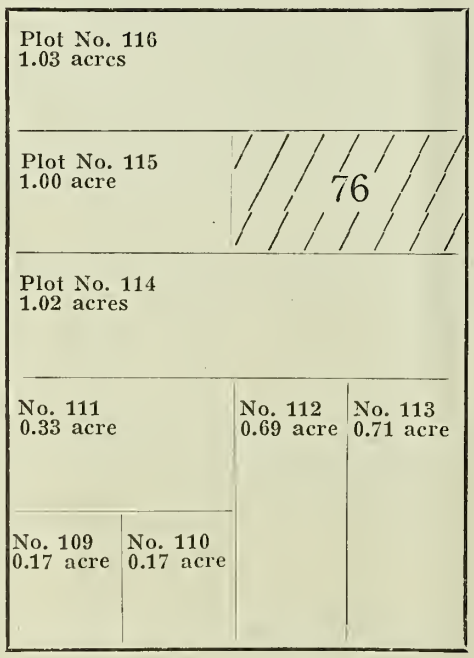
The remedy announced by Mr. Black to check the cherry fruit fly is to spray with a solution of one pound of basic arsenate of lead to 16 gallons of water, to which should be added four pounds of brown sugar or one gallon of some sweet syrup. This solution should be applied to the trees from a nozzle giving a coarse mist, each tree receiving a quantity of spray equivalent to about a pint. The first application should be made about June 10 and two following applications put on at an interval of five to seven days. If rains occur a new application should be made as soon as the trees dry off.

The cherry fruit fly lays its eggs on the fruit, injecting them just under the skin. These eggs hatch into small maggots which burrow into the fruit where they feed for a period of 15 to 20 days rendering it unfit for use. On leaving the fruits the maggots drop to the ground where they burrow in and remain until the following spring, emerging usually about the latter part of May as adult flies. Fond of moisture, the fly is said by Mr. Black to appear on the fruit early in the morning, where it may be seen drinking dew from the leaves. After the dew has dried off is the time recommended to apply the spraying solution alluded to above.



MARSH OF
CLATSOP CRANBERRY
COMPANY
Allendale, Oregon

Wednesday, October 8, 1919.
Weather: A.M. Fair.
P.M. Fair.
Begin 8:30.
Ended 5:45.



DAILY REPORT No. 15.

Previous day's final ticket number	20810	
Today's final ticket number	21114	
Difference	304	
Number measures picked	304	
Equivalent in crates		76
Number of crates raked		16
Total for day		92
Previous day's season's total		873
Today's season's total		965
Number pickers		27
304 Measures at 25c	$76.00	
Total picking cost		$76.00
Picking cost per measure	.25	
Picking cost per crate	1.00	
2 Rakers at $5.00 per day	10.00	
Total raking cost		10.00
Raking cost per crate	.62½	
1 Truckman at $5.00 per day	5.00	
1 Checker at $2.50 per day	2.50	
Total trucking and checking cost		7.50
Trucking and checking cost per crate	.08	
Total harvesting cost		93.50
Harvesting cost per crate	1.02	

Remarks: Anderson sisters made $9.75 today, one picking 19, other 20 measures.

171067

Yakima Valley, Washington, Apple Packing Houses

By C. L. Robinson

WITH the ever increasing cost of of packing and the serious car shortages we may expect, it is very evident that we must pay more attention to our packing and warehousing facilities in our fruit growing districts in order to do all possible to cut down the expense of handling and to protect the fruit until it is shipped. As one looks over the various types of warehouses and the methods of construction he is impressed with the lack of a standard. In many houses we find details of poor construction and arrangement while in others we may learn of points of interest and benefit. Frequently in attempting to keep down the cost of building the owners have sacrificed economy in handling. Some growers, under special conditions may be able to get along with a tent or shed but as a rule experience has shown that cheap construction does not pay.

In the Yakima Valley, Washington, we have two main kinds of warehouses and packing houses, those on the farm and those at the shipping points used by the growers' organizations and dealers. In this county we have cold storage for about one-fourth of the apple crop and some kind of common storage for about one-half of the crop. Among the many examples of packing and storage houses we may select a few as typical of the better class of more recent construction.

The first illustration shows a popular type combining a warehouse and barn. This building was erected about three years ago by Mr. C. M. Carlos on his forty-acre orchard near Selah and would now cost about $7,000. The apple storage part is 40x60 feet with a capacity of 11,000 boxes and is of hollow tile construction with a concrete floor and air ducts leading to the cupalos. The air intake is through troughs in the floor which have water in the bottom and a grating on top. By proper management of these vents a fairly good temperature has been maintained in the storage room. There are, however, only four of these intakes when twice as many would be much more desirable in order to increase the air circulation. The hay loft overhead holds forty tons and the lean-to on one side is used at one end for a barn and at the other for a packing house through which 200 boxes a day may be handled. It would be better if this room were larger and had a skylight in the roof. The storage room has the advantage of being separate from the packing room and has double doors and windows.

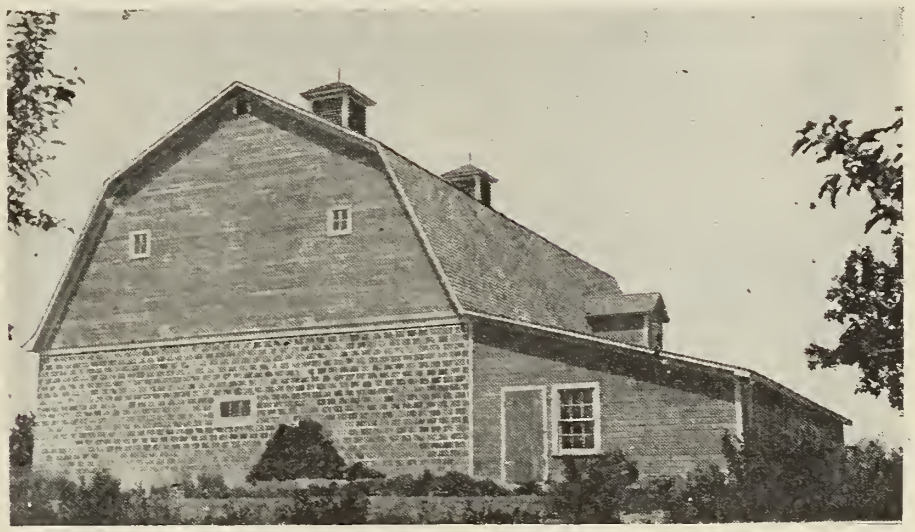
This type of building is fairly popular but with the increased use of tractors, the many reports of poisoned orchard hay and the agitation to work more of the alfalfa into the soil, we may expect its popularity to be transferred to a warehouse without the barn feature.

The second illustration covers a very good packing and storage house built by Mr. A. F. Conlon on his fifty-acre orchard also near Selah. It is perhaps more expensive than most growers would build for though originally built for $4300 it would now cost about $7000. It is also of hollow tile construction and has the advantage of being built on a side hill where the second story is readily accessible. Its capacity for storage is about 20,000 boxes but the upper story is usually used for sorting and packing. The basement has an earth floor with provisions for wetting it and with a grate flooring two feet above. Twelve adjustable air intakes and good ducts leading to the skylight provide for circulation. An interesting feature is a telescope air shaft through the second story which may be put out of the way during the day when the floor is used for sorting and packing. The building is to be equipped with an elevator and now uses an endless belt grader and a Cowan Lift for trucking fifty boxes of fruit at one time.

The third illustration is of the extremely simple type. It is of very cheap construction, in fact too much so to be desirable, but would be practically frost proof, if the roof, doors and windows were doubled. A very even temperature was maintained a year ago for early cooling and storage by good management in opening the large double doors at the near end and a smaller one at the opposite end at night and closing them in the morning. Too little attention was paid to proper light and convenience for sorting and packing.

The fourth illustration shows a house of the community type operated by the Horticultural Union which will handle 3,000 to 4,000 boxes per day. The packed fruit is received at the doors on the left and the unpacked fruit at the conveyor lift at the right center. These arrangements make for little delay to the man bringing the fruit. The sorting and packing room is on the second floor where skylights are available and the roller conveyor system carries the fruit to all parts of the house. Here 1200 boxes are packed per day without the aid of a mechanical grader, and the building will care for 55 cars of apples in common storage.

Some of the medium sized houses use a cheap frame section for their packing room and an insulated storage room of better construction. Too many houses use a pent-house for overhead light when a skylight would be cheaper, give better light and keep the room warmer during cold weather. Some houses are



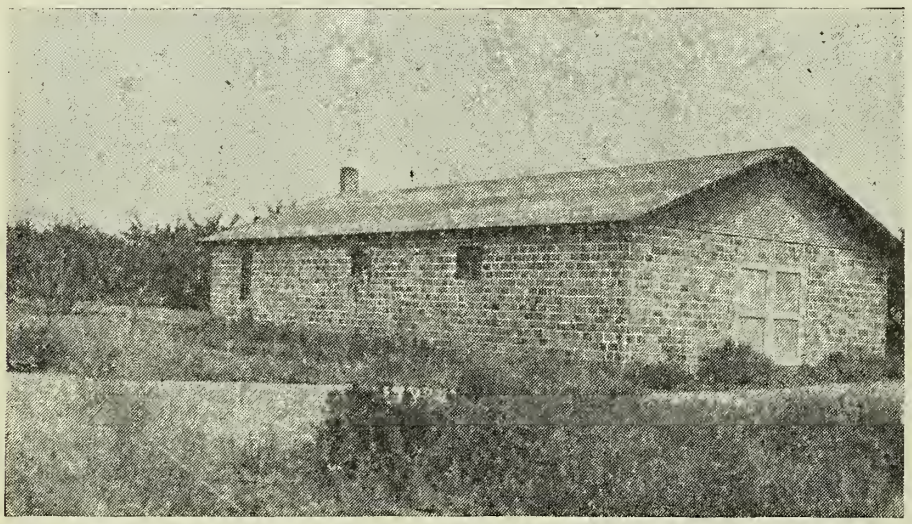
A Combination Apple Storage House and Barn.

A Good Type of Storage House.

so built that a partition separates the unpacked fruit from the sorting table in such a way that the fruit may be dumped on the end of the machine in the storage room and then carried through the partition to the packing room which may be heated for the comfort of the sorters and packers. One warehouse here is now equipped with portable electric operated belt conveyors which have proven quite successful in taking the fruit into the building and distributing it. The sections are about 20 feet long and may be moved about at will. Most of the larger organizations and dealers now have cold storage and in these plants the packing room is frequently found on the upper floor with skylight and wall light to assist the sorters and packers. The best arranged houses have a room into which the fresh fruit may be received and kept cool until time to pack. The fruit is then moved by means of conveyors to the sorters and from the sorters direct to the packers bins. Conveyors then carry it past the nailer to the storage room without interruption. Some of the farm packing houses follow out this principle to good advantage but far too many of them make no adequate provision for caring for the fruit in storage either before or after packing and no attention is paid to routing the fruit through the packing room in an orderly manner. Many growers might take better advantage of their present equipment in regard to both storage and systematic and economic handling. It is a well known fact that the earlier and softer fruits especially keep much better if cooled down as soon as possible after picking but many growers do not take advantage of what means they have for getting it out of the sun and cooling it off.

As yet there seems to be no more of a standard in packing house equipment than in construction. Many people have tried out various kinds of mechanical graders and sizers and almost as frequently have discarded them. Some of the main troubles with some of these machines has been the inability to get enough fruit over them in a day, the over-crowding of a few bins with certain sizes and the large percentage of mechanically injured fruit resulting from their operation. Some of the best packs in the valley are put up from modifications of the old style canvas bottomed tables.

Perhaps the most popular method of sorting is the use of an endless belt table. These tables consist of a wide canvas belt or a series of narrow ones running the length of a long table. The table is usually divided into several lanes down which the fruit moves. The central one usually carries the unsorted apples and as they pass the sorters they are placed in the various lanes or bins at the side according to grade. The culls are dropped in pockets from which the return belt carries them to a dump at the end.



An Extremely Simple Type.

Storage House of the Yakima Horticultural Union.

With any system so far devised the sorters and packers are prone to get the bins too full and then by mauling the fruit around cause needless stem puncturing and bruising.

As a parting word to those who contemplate building soon it would undoubtedly be worth their while to get in touch with the U. S. Bureau of Markets, Division of Storage Investigations at Spokane, Washington, or Washington, D. C., as these offices have on hand valuable information in regard to the best types and specifications for fruit warehouses.

Dried, Evaporated or Dehydrated

By Arthur W. Christie, Instructor in Fruit Products, University of California

The removal of moisture by drying in the sun has been used as a method of preservation for fruits and vegetables since biblical times. We are now witnessing the phenomenal growth of a new industry which bids fair to disturb and possibly to overshadow the earlier methods. This industry proposes to dry our fruits and vegetables by artificial means and not to depend on "old Sol," who sometimes forsakes his disciples. A large number of "drying" machines of varying construction have already appeared on the market, and frequent additions to the family are reported. A variety of terms has been used in naming these machines as well as their products. The most common terms are "dryer," "evaporator," and "dehydrator." Since there are no well defined distinctions between these various terms, the use of a number of different terms meaning essentially the same thing is confusing.

This confusion was most noticeable at the recent convention on evaporation of fruits held in San Jose, February 7, 1920, under the auspices of the Agricultural Extension Division of the University of California. Several of the speakers used the terms "dried," "evaporated," and "dehydrated" indiscriminately, it being often impossible to ascertain the speaker's real meaning. In order to clarify the terminology used in fruit drying a committee on nomenclature was appointed by the chairman of the convention, Professor W. T. Clarke. The committee included in its membership a representative of the Agricultural Experiment Station, the United States Department of Agriculture, and several men closely in touch with the commercial aspects of the situation. The membership of the committee was as follows: Chairman, A. W. Christie, instructor in fruit products, University of California; P. F. Nichols, division of dehydration, bureau of chemistry, United States Department of Agriculture, Atascadero; E. M. Sheehan, dried fruit broker, San Francisco; S. C. Simons, manager of dried vegetable department of E. Clemens Horst Company of San Francisco; H. C. Rowley, editor of "California Fruit News," San Francisco.

After thoroughly investigating the nomenclature of dried fruits and vegetables as well as the various devices for their production, this committee

made the following recommendations:

1. The same drying nomenclature shall be applied to fruits and vegetables.

2. The term "dried" is applied to all fruits and vegetables preserved by removal of moisture, irrespective of the method of removal.

3. There are but two general classes of dried fruits or vegetables, namely, those dried principally by solar heat and those dried principally by artificial heat.

4. The class dried principally by solar heat shall be designated "sun-dried," by which is meant the removal of moisture by solar heat without control of temperature, humidity or air flow.

5. The class dried principally by artificial heat shall be designated either "evaporated" or "dehydrated." The committee finds at this time no sufficient reasons for distinguishing between "evaporated" and "dehydrated." These two terms are synonymous and may be used interchangeably.

The above recommendations were first submitted to the College of Agriculture of the University of California. Dr. H. J. Webber, director of the Agricultural Experiment Station, makes the following statement:

"The nomenclature proposed by the committee has also been adopted by a committee of the college of agriculture of the University of California for use in the publications on dried fruits and vegetables."

The nomenclature committee recommends that the above definitions be adopted by all concerned. The committee feels that this would largely eliminate the existing confusion.

Brown Rot of Apricots and Its Prevention

By W. L. Howard, in Charge Deciduous Fruit Station, Mountain View, California

DURING the past five or six years the brown rot disease of apricots has been rapidly on the increase in California, especially in the San Francisco Bay region and the coastal valleys. While brown rot is comparatively new to California, it is one of the oldest diseases of stone fruits in the eastern and southern states and in Europe. Strangely enough, the brown rot is a midsummer disease in the eastern states, and never attacks anything but the fruit. In California it does its chief damage by attacking the flower clusters and then quickly killing the fruiting spurs. The disease may attack the fruit of apricots and even prunes when full grown or nearly ripe. Our chief protection against damage to the ripe fruit is the dry atmospheric conditions which prevail in June and early July. Peaches, in the interior valleys particularly, are safe because the air is much too dry during July and August for the fungus to make any progress.

Weather conditions seem to have a good deal to do with the occurrence of brown rot, as it attacks the flower clusters in early spring. The colder and wetter the weather at blooming time, the greater the danger of brown rot occurrence. As a rule, the disease occurs most abundantly in low places where there is most likelihood of frost injury.

The disease appears in early spring, just after the trees are out of bloom, first attacking the blossoms, then spreading into the fruit spurs. The flower clusters are quickly destroyed, and the spurs and sometimes even the older wood are killed in a very short time. Although the rot spreads downward, it rarely kills wood that is more than two years old. The fungus may be carried into five or six-year old wood through the medium of a short spur, but here it has to stop, as it is unable to go any further. The disease is characterized by excessive gumming of affected twigs, particularly at the point where it has been checked in its spread.

In January, 1920, the University of California established at Mountain View in the Santa Clara Valley a Deciduous Fruit Experiment Station. One of the first problems taken up was a study of control measures for the brown rot disease. Seventeen or eighteen different spray treatments were tried. At the same time several commercial orchards that had been sprayed one, two, or three times were kept under close observation. As a result of these experiments and observations, it is now believed that a single spraying of lime sulphur at winter strength, that is, one gallon of lime sulphur to nine gallons of water, if given just as the trees are coming into bloom, will control the disease. Dry lime sulphur twelve pounds in fifty gallons of water also gave good results, and bordeaux mixture 4-5-50 was also effective.

The main thing is to spray before the flowers begin to fall. The ideal stage at which to spray would be after the latest buds are beginning to show pink and as the forward buds are beginning to open. Spraying with any materials as the trees were going out of bloom did little or no good. Spraying with lime sulphur 1-30 as the leaf buds were beginning to open caused serious injury to the foliage. Spraying with a crude oil emulsion when buds were much swollen caused no injury to the buds, probably due to the fact that the weather was cloudy. We are not yet ready to advise using oil sprays so late in the season; they are very promising, however, and will be given further trial. A miscible oil spray, applied when buds were much swollen, gave no protection whatever against the disease. The same is true of lime whitewash and of dry sulphur dusted on the trees.

Spraying when buds were swelling but none showing pink gave considerable protection, but was less satisfactory than where buds were showing pink or even opening.

The experimental trees were sprayed at different times and with different materials from February 17 to March 10, but up to the present writing (June 22) no injurious effects are noticeable on either fruit or foliage. The same is true of two large commercial orchards nearby which are under close observation. One of these orchards has been sprayed three years in succession with lime sulphur against the brown rot. This season it received three applications, two before the bloom and one after. The owner of this orchard feels that spraying with lime sulphur after the trees are out of bloom not only does no good whatever, but is likely to cause the fruit to be smaller than it should be.

It is impracticable to try to cut out the diseased twigs for six or eight weeks after blooming time or until after the disease has stopped advancing and new sprouts back of the diseased area have come out. Cutting before the dormant buds begin to break may be worse than useless, as it is difficult to tell whether all the diseased parts have been removed or whether one is cutting unnecessarily far back on the twigs. There is very little danger of the disease spreading from the dead or dying twigs to the fruit. All these twigs, however, should be removed, at the latest, when the winter pruning is done. Many prefer to take them out just after the fruit is harvested. This is very well, as the diseased parts are much more easily recognized then than in winter.

The best protection against the rot in the fruit is to thin the apricots so that they do not touch, even when ripe. Where fruits stand alone, moisture from dew or fogs at night will dry up so quickly that the spores of the disease are unable to germinate.

The apricot crop in the Santa Clara Valley this year was reduced perhaps 25 per cent by the brown rot. In the foothills there are some orchards with only a trace of the disease, while in the valleys and in the mountains the loss ranged from 10 per cent to 100 per cent.

The brown rot probably spreads chiefly from the spores which ripen on the decayed fruits. It is customary in harvesting for the pickers to leave the fruits showing a little rot on the trees. These dry up and hang on all winter. In the spring these mummied fruits are covered literally with tens of thousands of spores which blow away and, if they find congenial conditions on flowers or fruit, quickly germinate and grow. All mummies should be picked off and burned. At the same time, all diseased twigs should be cut out and the prunings raked up and burned.

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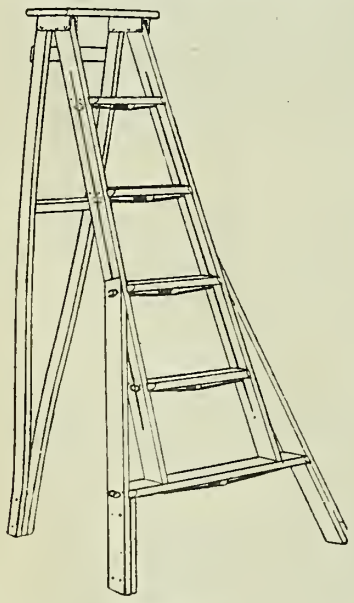

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Bits About Fruit, Fruitmen and Fruitgrowing

Sydney Stott, of Melbourne, Australia, who owns an apple orchard of 150 acres in his home country was a visitor at the office of Better Fruit recently. The reason for Mr. Stott's visit to the United States was for the purpose of determining if there was a market here for Australian apples. As the Australian crop of apples is harvested in March and April or about the time that the previous year's crop is pretty well distributed he and other Australian apple growers figured that they could probably dispose of some of their surplus fruit in the states. After a trip extending across the continent and back, however, the Australian stated that he was convinced that there was little if any market here for apples from Australia. One of the reasons for attempting to market Australian apples here this year was the fact that the English government was unable to provide sufficient ships to transport the fruit from his country to European markets. Mr. Stoot's visit to the United States this year was not his first as he has made several trips to this country and on a former visit took back with him an expert packer who introduced in Australia the American method of packing apples in boxes. While the fruit growing industry in Australia is becoming a very important factor in the country's resources, Mr. Stott said that there were a number of problems confronting growers there that must be solved to place in on a more stable basis.

Joseph H. Steinhardt, one of the best known fruit men in New York City and head of the firm of Steinhardt & Kelly, recently moved his business into a new $200,000 home. This new departure, or perhaps we might better say this new establishment was the occasion of Mr. Steinhardt receiving many complimentary letters from men in the trade and also articles in the trade papers. The following taken from the Fruit Trade Journal is characteristic of what the fruit trade in New York City had to say about Mr. Steinhardt personally and about his success: "Mr. Steinhardt's successful career has been punctuated by long hours and hard work. After selling fruits from a peddler's wagon, this man of vision slept that the dawn might find him busy at his task. Nor were his thoughts only of markets and sales. He saws the stars and reflected that less fortunate men than he had a heart and soul as well as a brain and body and that man had far from completed his work in this world if he left the world not better than he found it. No worthy charity ever appealed to him in vain. His mind and his soul are cast on a generous mould and his heart goes out to all men in need, to one case as well as another, to the remotest corners of the earth as well as at home. His firm has made a place for itself in the apple industry of the Northwest which will ever be remembered with gratitude and affection by growers. Mr. Steinhardt brings to his new home a splendid staff of employes, the hope of service rather than personal success, and the good wishes of the trade which gives all the surer ground for prediction of the highest achievement."

While we do not look on the southern states as a very large factor in the production of apples it will be interesting for the average apple grower to know that last year they produced 24,898,000 bushels of apples with a market value running up into the millions. Georgia, the state farthest south engaged in the commercial production of apples produced a crop valued at $1,548,000.

Early reports of apple crop prospects outside of the Northwest are that New York and New England looks for normal crops; Maryland for a better crop than last year, while Virginia expects about 60 per cent of the 1919 crop. Due to the freeze in the early spring Missouri reports about 45 per cent of a full yield while southern Kansas and some of the other middle western states report conditions as about the same as in Missouri.

Picketed ponies and wigwams seen at Hood River, at strawberry season in former years in every watered copse of the berry districts, have vanished. Indians who come down from Yakima and Warm Springs for strawberry harvest ride in the most modern conveniences. Their automobiles are characterized by their newness and expensiveness. While squaws and papooses contine to wear the gayest colored shawls obtainable and carry beaded bags that arouse coveted glances from white sisters and the bucks stroll about with their long hair done in plaits, the old wigwam has been discarded for the latest motor camp equipment. Baby Indians do not seem so much in evidence as in former years, but those brought along are rarely seen in any modern go-carts. The redskin mother may ride in an eight-cylinder car, but she clings to the old board and basket baby carrier.

Indians, so those who are here now declare, have prospered mightily the last few years. Most of them own land allotments that have been used for wheat growing. The redskins make no protest when they pay 18 cents per loaf for bread. Comparatively few participate in the berry harvest now. Several years ago Indians, coming here as many as 500 to 1,000 in a season, were the chief berry harvesters. It is likely that not more than 50 are here this season. Some Indians are here merely as tourists. A grower the other day approached a buck and started to dicker for the services of himself and family. He was informed in the best of English that the party whose services he desired was merely on a vacation.

"That's our car," said the Indian man with bauteur, pointing to a handsome eight cylindered Cadillac.—Hood River Glacier.

What They Are Doing in California

The 1920 cantaloupe acreage in the Imperial Valley is reported to be 22,000 acres as against 14,000 acres in 1919. At the rate of production last year it will require 10,000 cars to move the 1920 crop at the rate of 300 cars per day.

The largest and most modern lemon packing plant and processing plant in California has just been completed at Maxwell, Colusa County. It will handle the greater part of the lemon product of the Sacramento Valley.

A new fruit cannery being built at Santa Rosa when it is completed will be the most modern fruit handling plant in California and will give employment to about a thousand persons. The new plant will cost $250,000.

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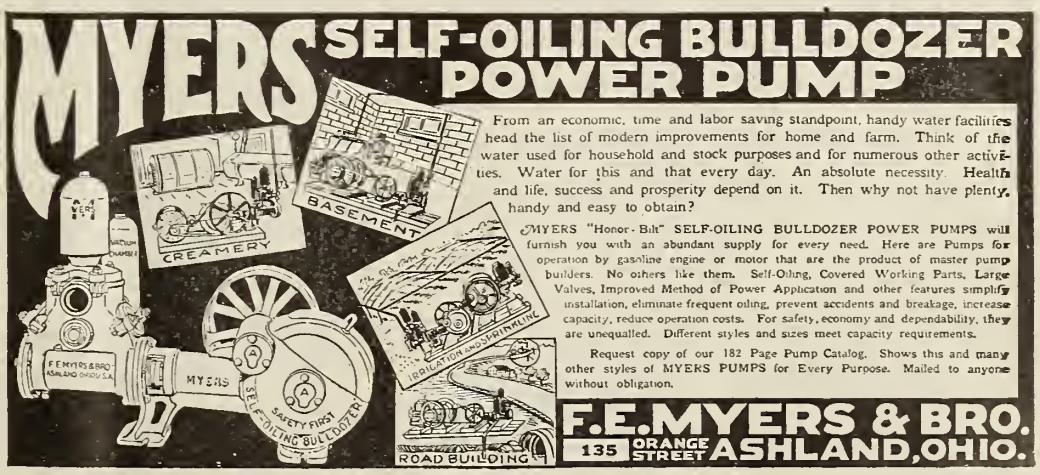

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The office of standardization of the California Department of Agriculture recently caused the arrest of 32 strawberry growers who failed to pack their fruit according to the state's regulations. The court imposed fines varying from $35 to $50 on the offending growers.

Strawberry growers in Alameda County are very much concerned over the appearance there of the strawberry root weevil. This pest has become so serious there that the California Department of Agriculture has assigned several of the department's experts to stamp it out. It is claimed by California experts that the infestation was brought into that state by strawberry plants imported from the Northwest several years ago.

California will be one of the few states that will have a bumper peach crop this year. Estimates at the present time place it as being fully as large as it was last year when 2,773 cars were shipped. Optimists estimate the yield at a still higher figure and say that they expect to see 3,000 cars shipped to eastern markets.

Shortage of cans and the high price of sugar it is claimed will result in a short pack of fruit being put up in California this year. According to the statements of canners a pack that will not exceed 75 per cent of the normal output will be put out. Prices for canning fruit are also considerably higher than last year, a condition that canners say will have its influence in limiting the pack. Growers it is reported are asking $65 to $100 a ton for pears; $110 a ton for peaches and $100 a ton for apricots.

Cannery Notes

Having leased the building formerly occupied by the Albany Fruit Juice Company at Albany, Oregon, R. V. Foreman and C. E. Pratt will engage in the manufacture of vinegar.

A cannery plant which will be ready for operation August 1 is being constructed at Oroville, Washington. The new plant which is located in the center of a large fruit growing district is largely financed by the business men of Oroville. F. W. Fraser, formerly of Canada, has accepted the position of manager. The main product that will be handled by the cannery this season will be tomatoes, the output of 200 acres having been contracted for with local growers.

The new cannery and drying plant of the F. A. Kurtz company which has been completed at Salem, Oregon, expects to handle a large tonnage of prunes and other fruits this season. The new establishment is a complete two line cannery with a drying room that is said to have one of the largest capacities in the state.

Notwithstanding the light crop of cherries the Libby, McNeil & Libby cannery at Yakima, Washington, expects to can in the neighborhood of 400 tons of cherries this year. The company estimates that to do this it will need 150,000 pounds of sugar and has purchased this amount for its season's run. It is reported that the amount that the company has invested in sugar for its Yakima plant is $37,000.

The cannery of the Oregon Packing Company at Lewiston, Idaho, the largest in that section was overhauled early in the season and is now engaged in putting up its cherry pack. Although the cherry crop is considerably below normal in the Lewiston district the company has prepared for a busy season in canning cherries and other fruits.

The A. Rupert Company, Inc., which started the erection of a cannery at McMinnville, Oregon, this year, announces that the establishment will be ready for operation when the canning season opens. A feature that the Rupert Company has adopted in connection with its canning business at McMinnville is that it is furnishing seed to growers of canning products at cost.

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Competition In Apples.

The announcement of the United States Bureau of Markets that the Northwest box apple industry has expanded from a shipment of 3,722 cars in 1916 to 8,378 cars in 1919 is most encouraging to those who have followed the business from year to year. A very significant point in the marketing of last years' box apple crop also is its much wider distribution. It is shown that whereas a few years ago New York and Chicago were looked upon almost as the beginning and end of the market for box apples, in 1919 large increases in the sales of box fruit took place in 10 of the largest cities in the United States while cities of smaller population, in some instances located in the heart of the barreled apple districts sold large quantities of the box article in direct competition with barreled fruit.

In fact the increase in box apples sales over the period mentioned have been so noticeable that the Bureau of Markets in sizing up the situation says that the consumption of barreled apples seems to be decreasing, as 25,941 cars were marketed in 1916 as compared with 17,798 cars in 1919. While this statement is cheering to the box apple grower and handler we believe it ought to be discounted a little on account of the smaller barrel apple crop last year. The main point, however, is that the demand for box apples has grown wonderfully and is very evidently due to grow still more by concerted action in making not only the excellence of the fruit but the package itself known in every section of the country. Many persons will buy a box or a basket containing a bushel of apples that will not or cannot buy the cumbersome quantity of a barrel.

In this connection the statement of a well known eastern horticultural writer made several years ago is interesting. In writing of box apple competition with barreled apples he remarked: "How about the competition of the famous orchard sections of the great west, middle west and Pacific Coast. For myself I have no fears of serious competition from western fruit growers, enterprising as they are, when I consider that it costs about $300 to ship by freight a carload of apples across the continent, whereas the fruit growers of New York, Pennsylvania and Massachusetts may ship a carload of fruit to New York, Boston, or Philadelphia for from $25.00 to $40.00 per car."

And yet despite this handicap in the way of freight charges the demand for the box apple is growing and growers in some of the districts in the states mentioned in the foregoing paragraph have adopted the box pack. With the proper methods pursued there is no reason why the entire output of Northwestern apples cannot be disposed of on a permanently profitable basis, no matter what the competition may be against them.

The "Come Back" of the Prune.

The question is frequently asked, "has the prune industry come back to stay?" Perhaps the best answer to this query can be found in the recent statement of the California Prune and Apricot Growers' Association that on May 15th the association notified its brokers that a limited quantity of the new crop of prunes would be booked at the association's prices. Within 24 hours the association had received orders for so many carloads of prunes that it had to withdraw its offer fearing that it would not be able to fill them.

This is interesting news to prune growers generally and particularly to prune growers of the Northwest as no phase of fruit growing has had so many ups and downs in this region as prune growing. When the prune growing industry sprang into prominence in the Northwest the demand was strong and prices were good, due to the limited supply. Profitable prices caused the planting of many prune orchards with the result that the supply exceeded the demand and prices fell. As a result hundreds of acres of prunes were grubbed out and set to other fruits. Later the demand for prunes was renewed and has continued almost without interruption since. During the last three years prunes have been big money makers and indications are that they will continue to be.

In the early days of the industry prunes, like other fruits, were marketed by haphazard methods. Now they are being sold on a business basis. Marketing organizations that insure a wide distribution and the advertising of the product have taken hold of the game. The product is being put up into attractive packages of various weights and prunes are taking their place in every household along with the other fruits.

Therefore the prune has come back and evidently come back to stay.

Getting Cars.

Realizing that the car shortage will not be adjusted without considerable pressure and that the time to try and avert it is several months before the time to commence the heaviest shipping of fruit the Yakima Traffic and Credit Association representing Yakima shippers and the Yakima Commercial Club, representing the business interests of that section have entered on a campaign to secure as many cars as this district needs. To carry on this movement and also to keep up the fight against the proposed increase in freight rates on apples amounting to almost 24 per cent a fund of $15,000 has been raised.

As other fruitgrowing districts are in the same position as Yakima they would do well to form a similar organization for a similar purpose. By starting a movement to secure cars now something should be accomplished when they are most needed. A presentation of the needs of each district to the railroad companies far in advance of the shipping season would at least be a great help in allowing them time to apportion the cars as equitably as possible.

What the Papers Interested In Fruit Are Saying.

Another sure way to increase production and speed the back-to-the-farm movement would be to place the burden of taxation on idle lands held by speculators and sportsmen instead of upon cultivated lands and farm improvements; to equalize freight rates on farm products; to open and develop new water-shipping routes and to extend the Farm Loan system so as to make it easier to borrow money and own farms than it is now.—*Fruit Trade Journal.*

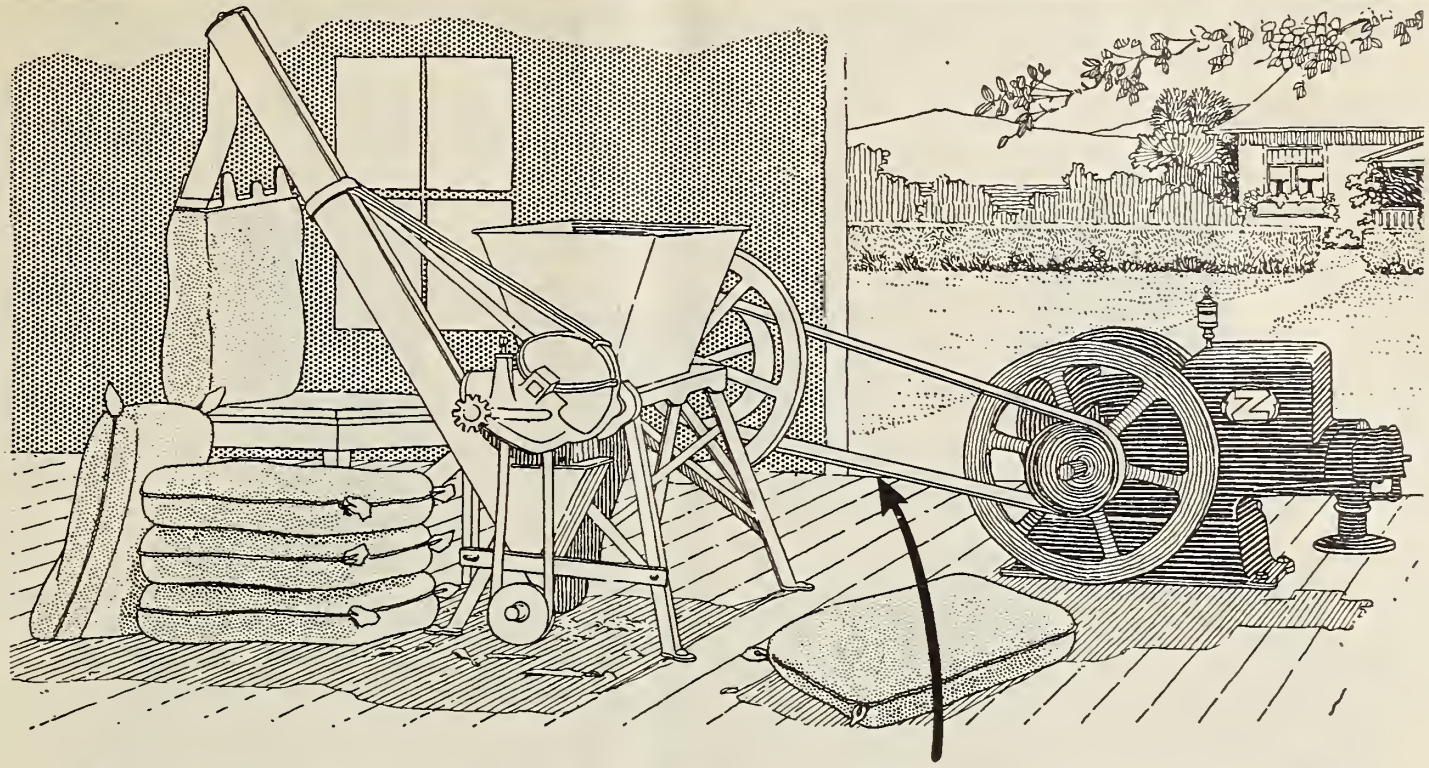
Ye Editor in a grocery store in San Jose bought a pound of prunes for just 30 cents the other day. The weight was accurate, and there were 53 prunes in the pound. They were good prunes. They had not been processed, and presumably were bought direct from some grower. The association's opening selling price for that size in bulk was a fraction over 13 and one-quarter cents. If he paid 15 cents he is making 100 per cent as his gross profit. He is getting more for handling that pound of prunes than the average grower got for producing and delivering its kind to the packing house.—*Sunsweet Standard.*

Believing that more complete pollenization of apple blossoms would strengthen the set of the fruit, W. B. Armstrong, L. J. Shadbolt and a number of neighbors in the Lower Naches this spring rented 150 stands of bees from an apiarist and placed them at central points in the orchards. Just before the calyx spray the owner of the bees was notified, and removed them. "I am not prepared to say," says Mr. Armstrong, "that the result will increase our crop by any definite percentage. But the indications are that through the whole district, the set of fruit is stronger, and the drop less, than it has been in previous seasons. In fact it looks as if we would get a real crop this year. We think enough of the results so we are planning to make a similar arrangement next year."— *Big Y Bulletin, Yakima.*

New York state fruit growers are unquestionably becoming interested in the matter of auto truck trailers. Men who say they are qualified to speak for the trailer industry, make the positive statement that auto trucks may have their capacity doubled by the use of trailers with only the expense of 10 per cent more gasoline and a lessening of the ordinary speed by only 10 per cent, as well. If these statements are correct,—and there is no substantial reason for questioning them,—then the fruit grower who has an auto truck or is contemplating purchasing one for the convenient and expeditious transportation of his perishable products, might well give serious consideration to the additional investment required for a trailer which will accomplish so much at such little additional cost.—*The New York State Fruitgrower.*

Yakima Union Buys Graders

Mechanical apple graders will be used in the Yakima Valley this year on a wider scale than ever before. The Yakima Horticultural Union, which handles thousands of boxes of apples has purchased four graders which will be installed in its various warehouses throughout the valley. Three of these machines are Cutlers of the new improved type, capable of handling a large number of boxes per day and one of them is a Price. The graders will be distributed at the points in the valley where the union is handling the greatest tonnage and are expected to greatly facilitate the work of packing out the crop which has heretofore been largely handled by belt graders.



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Experience has made him confident of its ability to complete the job without loss of power or irritating delays through breaking.

"Test Special" is a guaranteed belt of service. It is especially adapted for hard, outdoor usage.

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WRITE TODAY, giving the R.P.M. and diameter of the driving pulley—also driven pulley and distance between centers of same; also give the rated horsepower of your motor or engine, and name kind of machinery you are operating. We will reply immediately giving you our recommendation as to kind of belt to use.

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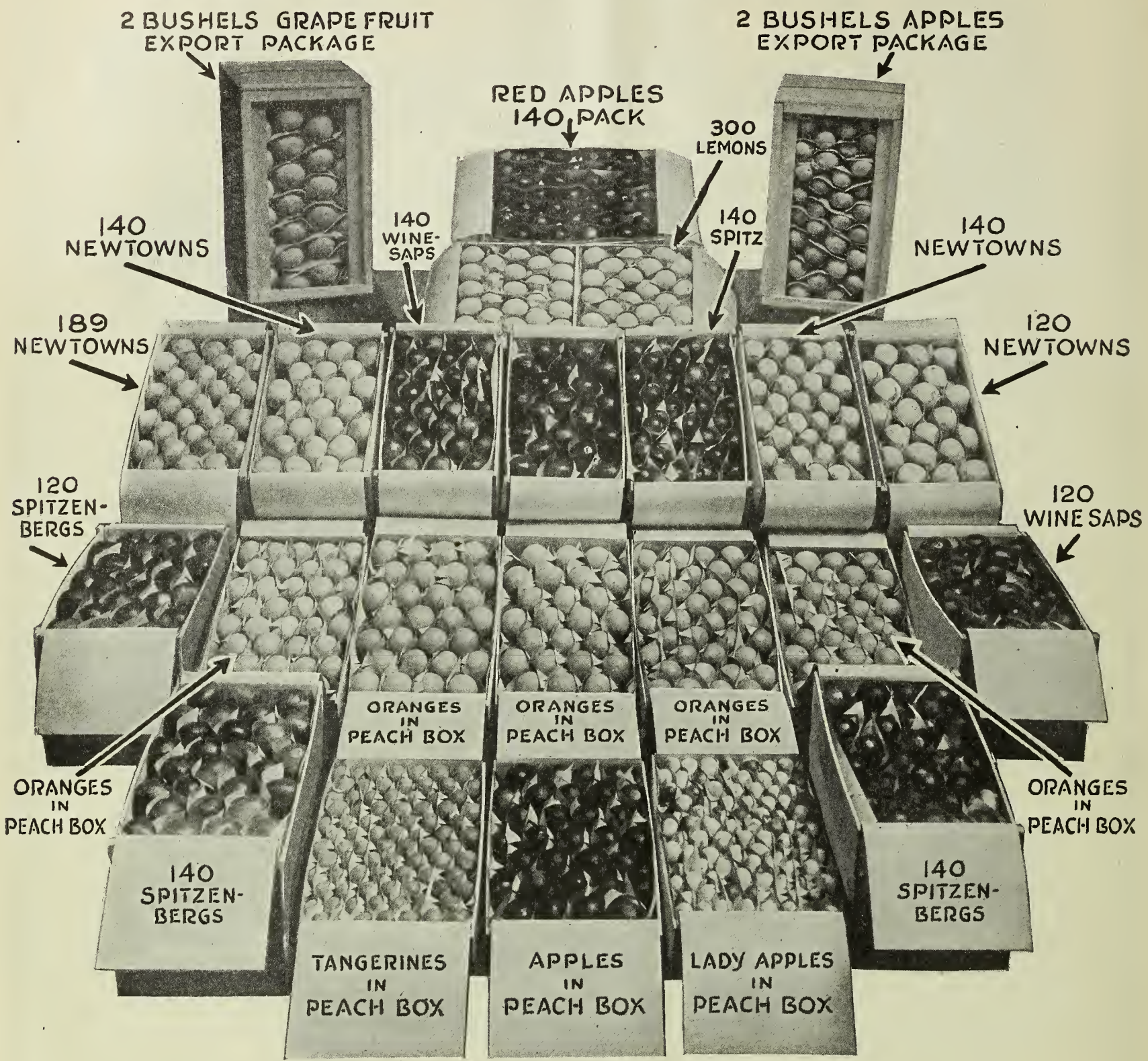

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Northwest Fruit Notes from Here and There

OREGON

Owing to the shortage of lumber and box materials, H. F. Davidson, who owns a large fruit ranch at Hood River and also a farm near Lebanon, Oregon, will construct a sawmill near the latter place with a capacity of 20,000 feet daily to work up a tract of fir trees on his Lebanon property.

The first full carload of strawberries to be shipped out of the Hood River Valley this year brought $4.00 per crate. This is said to be a record price for a carload shipment. The berries were shipped by the Hood River Apple Growers' Association. Strawberry pickers in the Hood River Valley are reported to have earned as high as $7.50 per day this year. Canning berries from this district brought high prices and in addition to the fruit that was taken by the local cannery a considerable quantity of berries were shipped to canneries in Portland by motor truck. The cherry crop at Hood River is reported to be light with prices ruling high. Most of the Royal Annes and other light colored cherries were taken by the canners while the black varieties were shipped out fresh.

The Phez Company at Salem, which has created a big demand for its various berry and other fruit products through a wide campaign of advertising has increased its capital stock from $1,000,000 to $1,500,000. Expansion of the company's business is given as the reason for the need for larger capitalization. The company recently sold 15,000 cases of jellies and jams to one firm. The shipment went to South Carolina. Up to the present time the Phez company which has made a specialty of manufacturing loganberry juice has not determined how much juice it will put up this year, owing to the high price of the berries and the light crop. The demand for the juice had been so great up to the middle of June that the company's stock of this beverage was reported to have been exhausted.

The announcement is made that Dufur will have a box factory. It was expected to have the factory in operation the latter part of June. The box factory will be operated in connection with two saw mills which will be erected at that place by the Phillips Lumber Company.

According to the program outlined by the Kings Products Company, its output of dried fruits and vegetables for the 1920 season will total $2,000,000. Officers of the company report an advance sale of this amount of its products for the coming season.

The Suncrest orchard at Medford, consisting of 461 acres, and planted to good commercial varieties of apples and pears, has been sold to Jones Brothers, canners and packers. The orchard was formerly the property of Dr. C. F. Page, but at the time of its sale was owned by the Mutual Life Insurance Company. It is said that the new owners who operate packing plants at Boston, Massachusetts, and at various points in the Northwest will erect a plant at Medford. The price paid for the orchard was $275,000.

A good deal of hesitancy is reported to be shown by Oregon prune packing corporations in announcing an opening price for prunes. This condition is said to be due to a number of conditions including the labor situation, which is causing prune handlers to be careful in sizing up the market for prunes and in announcing prices that they feel will handle all the crop to an advantage. Growers believe that the situation warrants a high price while buyers are anxious to get more information about local and foreign markets before fixing the first quotations.

Polk County cherry growers who pooled their product, amounting to about 200 tons, are announced to have sold their cherry tonnage to an outside buyer. Although the growers state that the prices received were satisfactory they have refused to announce them to the public. At the time of selling their crop growers fixed the picking prices for cherries which was placed at two cents a pound, with a bonus of a quarter of a cent per pound to pickers who remained until the crop was harvested. Cherry picking in this section commenced about the latter part of June.

The average price for loganberries and cherries at the end of the contract season in Marion County is stated to have been about 12 cents, although it has been difficult to obtain figures giving the exact amount. In referring to the loganberry price situation the Salem Statesman says: "Several pools have recently been sold at good prices according to reports. The Bruce Cunningham holding of about 200 tons has been disposed of at 13 cents. Other parcels of 75 and 100 tons have been disposed of, according to reliable reports, for the price of 13½ cents. Mr. Cunningham stated recently that the formation of the Marion berry pool was instrumental in raising the present price of berries. This is favorable to the small grower. He further asserts that he had personally offered 14 cents for his crop of berries but that he ignored the offer because it did not consider the interest of the small growers who are members of the pool. However, Mr. Cunningham claims that the members of the pool were forced to accept a price less than the 14 cents because of the sugar situation which he claims was utilized by buyers in breaking the lower figure. Regardless of this fall in price, some local buyers claim that the prices of 12 and 13 cents are the highest average scales ever attained in Oregon."

In organizing its marketing force for the coming season the Oregon Growers' Coöperative Association has secured the services of three men well known in the fruit industry of the Northwest. To manage the Medford and Grants Pass branches of the association, one of the most important, C. C. Lemmon, formerly of Hood River and later of Yakima, has been chosen. Mr. Lemmon has had a wide experience with various fruit shipping arganizations in Oregon and Washington and comes to the association from the Perham Fruit Company at Yakima. The local affairs of the association in the Dallas-Monmouth district

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will be under the direction of Charles E. Ramp of Salem. Mr. Ramp is a native of the Willamette Valley. At one time he was amployed by the Salem Fruit Union and for two years was connected with the Mason-Ehrman Company. J. H. Frazier, a Portland man, has accepted the position of traffic manager and assistant sales manager. Mr. Frazier occupied the position of traffic manager with the Pacific Fruit and Produce Company and previous to that was connected with the traffic departments of several of the large railroads.

WASHINGTON

A recent survey of the apple orchards in the Yakima Valley indicates that the output of apples in that district this year will be very materially reduced. Estimates now are to the effect that the shipment from there will be 2,000 carloads less than in 1919. The falling off in the output is said to be due principally to the freezing of the trees during the severe cold weather last winter.

M. L. Dean, chief of the Washington Division of Horticulture, announces that the summer meeting of Washington State Horticultural Society will be held at Wenatchee, July 14, 15 and 16. A feature of the meeting will be visits to the orchards in the vicinity of Wenatchee and Cashmere to examine the results of experiments which have been made with commercial fertilizers. Codling moth control work will be demonstrated and other orchard problems studied.

R. S. Hasbrouck, a rancher near Aberdeen, Washington, who already has 39 acres under cultivation to berries will increase his planting to 70 acres, making one of the largest individual berry farms in the state of Washington. Mr. Hasbrouck who believes in diversifying in small fruits, is setting out blackberries, strawberries, loganberries and raspberries.

According to a report from the Puyallup district pickers this year received 65 cents a crate for picking raspberries for shipment and 75 cents a cratc for canning berries. As an incentive to get pickers to remain throughout the season a bonus of 10 cents per crate was also paid. Thcse prices for picking berries were 10 cents a crate higher than those paid last year at the opening of the season, although higher prices were paid before the berry harvest was over to save the fruit. The prices for crates was 27 to 29 cents.

Prune buycrs who have bcen attempting to buy fruit in Clarke County for 15 cents are reported to havc had but little success, few growers agreeing to sign up. Before the end of the buying season in Clarke County last year prunes sold on the tree for as high as 20 cents per pound. Growers believe that the opening prices offered this year indicate that higher prices will be paid than last year.

Chelan County, one of the best known and largest fruit raising districts in Washington, is said to lead the Northwest in the number of motor vehicles owned in proportion to the population. Figures taken from the county auditor's office show that with a population of 20,000 people, that Chelan county has 5,000 motor vehicles. This is said to be a greater number per capita than California, which state heretofore has been given the credit for having more motor cars than any section of the Pacific Northwcst.

The strawberry season at Kennewick, Washington, which has closed, resulted in the marketing of 18,000 crates of berries by the growers' union in that district. The berry season at Kennewick was highly successful. The berry season started out with berries selling at $6 per crate and high prices were maintained throughout the season. The crop, which was almost entirely handled by the union was shipped out in bettcr condition than in any previous season, owing to the installation of a refrigerating plant this year in which thc berries were pre-cooled before being placed in the cars.

Frost damage in the Spokane Valley is estimated to have been remarkably low this year. Managers of fruit associations and growers in that district who have been checking up on the matter place the damage at about 10 per cent for all orchards. Most of the orchards affected were situated in low spots. Smudging in the Deer Park and some of the other sections where the temperature dropped as low as 22 degrees resulted in the saving of a number of crops.

The establishing of a wholesale fruit, vegetable and imported edibles concern at a cost of approximately $25,000 will be undertaken by Benny Caputo & Co., a Spokane fruit firm, according to Joe Luca, one of the members of the firm. "We are going to start a big wholesale business in fruit, vegetables and imported stuffs from South America," said Mr. Luca. "We will start remodeling the building on our new site July 15 and will open for business by August 1 or sooner." Part of the capital for the new venture is being placed by Albert Caputo, a relative of Benny Caputo, and now living in Italy.

The apple crop of the Spokane district will bc 20 per ccnt greater than last year's crop, according to C. J. Webb, assistant manager of the Spokane Fruit Growers' Company. "I would say that the Spokane district apple crop will be between 1500 and 1700 cars this year," said Mr. Webb. "The greater production is due to a general increase of crops in every section. The district contributing to this estimate includes Four Lakes, Davenport, Creston, the Arcadia Orchards, Stevens County apple growing sections, such as Meyers Falls, and Kettle Falls, the Coeur d'Alenes, Moran, Waverly and Fairfield."

H. A. Glen, general agent of the Northern Pacific, has issued his annual estimate of the 1920 fruit crop from the Yakima Valley. Mr. Glen's estimates in the past have been practically correct. He figures that Yakima will be the chief shipping center, with Selah second, Buena third, and Grandview fourth. He anticipates a material reduction in peaches. The carload estimate, with 1920 given first and the 1919 record second is: Peaches, 177,-2200; pears, 1234, 2000; apples, 12,930, 11,400; melons, 425, 400; mixed, 585, 430; cherries, 200, 75; strawberries, 30, 30.

District Inspector P. S. Darlington has completed his first tentative estimate of the fruit crop of the Wenatchee district for 1920. He estimates the total crop at 11,850 carloads as compared with 12,150 carloads last year The crop last year exceeded all estimates by a large margin, and with favorable conditions prevailing it may be the same this year. Every section of the district will show an increase except Wenatchce and vicinity. Here, Mr. Darlington estimates a crop of only 2500 cars as compared with 3835 cars last year. The marked shortage in Jonathans and Rome Beauties accounts for this heavy decline.

Cashmere, Dryden, Peshastin, Manson, Chelan, Omak, and Okanogan are said to promise a decided increase over last year's fruit yield. Cashmere is credited with a probable output of 2,000 cars, against 1392 last year. Omak should ship 1,000 cars instead of 663 last year. Okanogan is estimated at 450 cars against 330 last year. Malott should ship 200 cars against 125 last year.

District Horticultural Inspector E. G. Wood states that the apple yield in Walla Walla district will be approximately 40 per cent of normal. Some parts of the district will have nearly a normal crop while others are hard hit.

A numbcr of Yakima apple growers, who have large quantities of apples to pack out have organized the Bede Lumber Company for the purpose of manufacturing boxes and will establish their plant in Portland, Oregon. The plant, which will be located in the Kcnton district, will have a capacity of 12,000 boxes per day. Work has bcen started on its construction and active operation in turning out boxes will be commenced shortly.

The latest rccognition accorded to one of the Northwest's most famous fruit trademarks is in a half page advertisement in the Saturday Evcning Post by the Leo Feist Company of New York, announcing the publication of a new Indian novelty song hit entitled "Skookum." The Feist Publishing Company is one of the largcst New York song producers, and they announce that they expect at least a million circulation on the "Skookum" song. In addition to sheet music the music has been adapted to talking machine records and player piano rolls. The title page of the song shows in large size the well known smiling Skookum character and the words "By Permission of Skookum Apples."

To protest against proposed increases in express ratcs as applied to shipments of fruit from the Northwest, the North Pacific Fruit League was represented at the hearing before Examiner Barclay of the Interstate Commerce Commission in Spokane. The special committec from the league included Paul H. Weyrauch of Walla Walla, C. W. McCullagh of Hood River and C. J. Webb of Spokane. Increases suggested range from 25 per cent to 100 per cent.

IDAHO

According to the Bureau of Plant Industry of the Idaho Agricultural Department, the fruit acreage in that state is now estimated at 65,000 acres. Of the total acreage 45,000 acres are in apples, 15,000 acres in prunes and 5,000 acres in pcaches, cherries and pears. It is estimated that about 20 per cent of the entire acreage is in full bearing, 60 per cent in light bearing and 20 per cent not in bearing. Approximately 45,000 acrcs of the total acreage planted is located in Southern Idoha and 30,000 acres in Northern Idaho. The total fruit production in the state in 1919 is placed at 4,956 cars. Of this output 4,000 cars were apples, 500 cars were prunes, 350 cars peaches, 100 cars cherries and 6 cars pears. The estimated commercial fruit production in Idaho for 1920 is placed at 6,656 cars as follows: Apples, 4,769 cars; prunes, 1,818 cars; cherries, 64 cars; peaches, no commercial shipment; pears, 5 cars.

Shipments of Snake River Valley cherries bclow Lewiston were commenced this year the latter part of June, the season being three weeks later than last year. Buyers were slow in the early part of the season in quoting prices, but it is believed that on account of the scarcity of this fruit generally that growers will receive high prices for their crops. The price received at Lewiston last year was 12 to 13 cents while the canneries paid 8 cents. It is reportcd that the canneries have offered 12 ccnts for Royal Annes. The cherry crop in the Lewiston-Clarkston district will be lighter than usual. The peach and apricot crop in the Lewiston section is reported to be a total loss, many trees having been killed by the extreme cold weather during the past winter. Other fruits, however, give promise of fair crops.

Cherry growers in the Lewiston district have adopted an arrangement of pooling their crops, providing for a minimum sale price of 12 cents for Bings and Lamberts. A similar arrangement was carried out by the growers last year and worked out successfully. The Clarkston growcrs also organized along the same lines. Shippers have been somewhat concerned over a possible shortage of boxes, although a local factory attained ant output of 5,000 boxes a day. One packing firm received a shipment of 275 barrels, in which Royal Anne cherries were shipped, being placed in water charged with a preserving gas.

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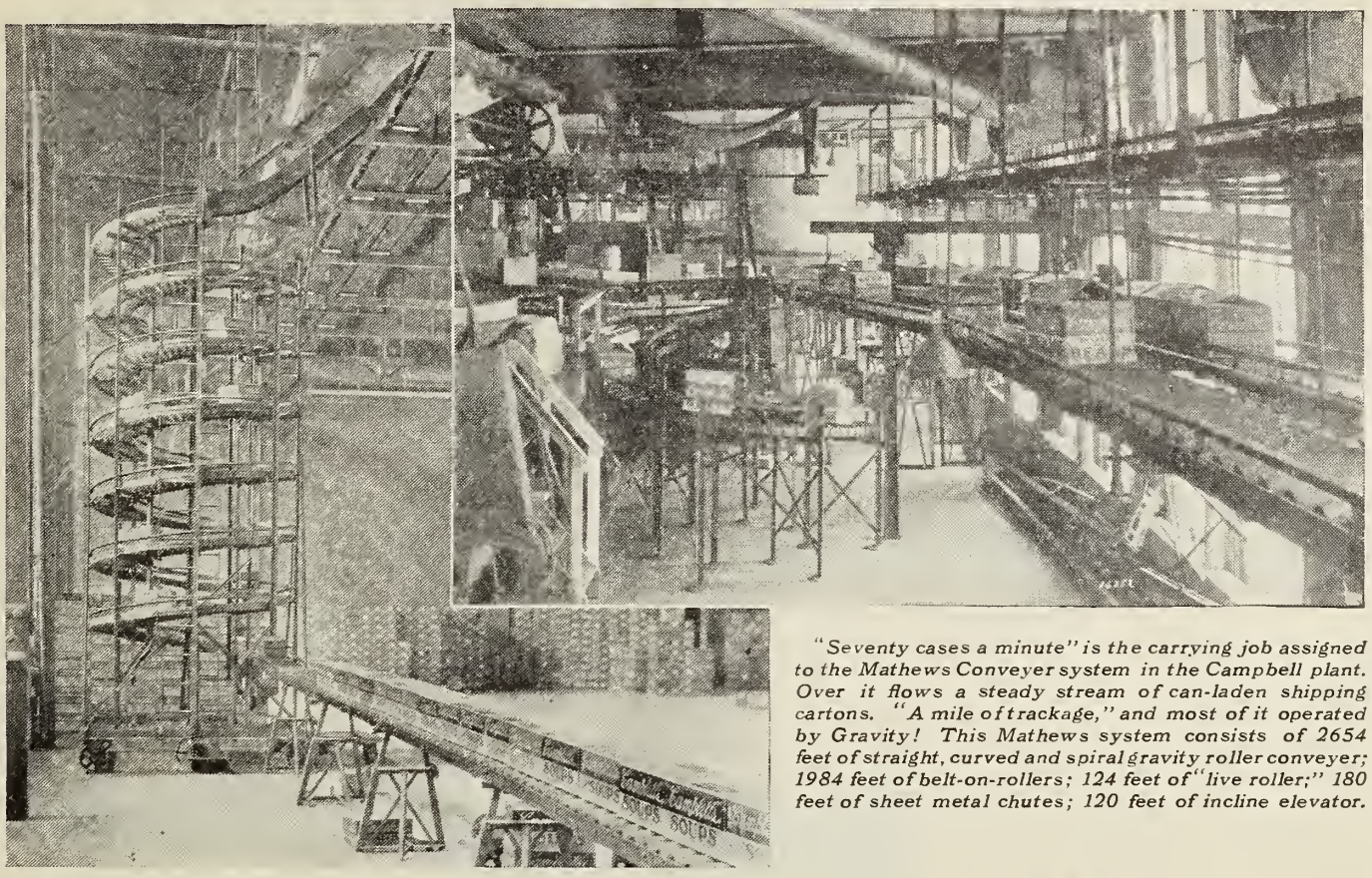
Parts of the Mathews Conveyer system in the Joseph Campbell Company plant at Camden, N. J.



"Seventy cases a minute" is the carrying job assigned to the Mathews Conveyer system in the Campbell plant. Over it flows a steady stream of can-laden shipping cartons. "A mile of trackage," and most of it operated by Gravity! This Mathews system consists of 2654 feet of straight, curved and spiral gravity roller conveyer; 1984 feet of belt-on-rollers; 124 feet of "live roller;" 180 feet of sheet metal chutes; 120 feet of incline elevator.

From the cars, through the plant, and back again—via Gravity

THE Joseph Campbell Company is "some tomato" in the canning field. To keep the millions of cases of "empties" coming from the cars, to keep them moving through the plant, to keep them going back, filled, to the cars, is no small feat in production routing and manufacturing efficiency.

For here time counts! A minute's delay, a slight interruption, the least congestion along the line of supply, operation and outlet, means many idle hands; multiplied labor loss; a deep cut into the day's margin of profit.

Today's supply of labor is far too precious—and uncertain!—its cost too great, to be consumed in such non-productive details as carrying or wheeling materials from operation to operation, moving goods to and from warehouse, loading and unloading cars, etc.

Use Gravity! It's free! Harness it! There's work—a job, a place, an operation, a detail—about your plant, be it large or small, where Gravity can be used and time, labor and money saved.

Mathews Gravity Conveyer system can be fitted, section by section, portably or permanently, to *any industry,* plant, yard or production route. Mathews drawn-steel, ball-bearing rollers are so perfectly balanced and responsive to Gravity that most anything, from fragile objects to heavy crates, boxes, barrels, bags, castings are conveyed gently at very slight inclines and at a moderate, uniform rate of speed.

Do yourself the good turn to look into gravity conveying. Drop us a line. We've a branch office near you, and a sales engineer courteous and willing to go over your plant and problems, point out the economies a Mathews can effect for you, and recommend the equipment *your* layout and business require—all without any obligation whatever on your part.

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OUR GENERAL LINE of supplies and equipment for the Orchard, Packing House, Central Packing Plant and Storage Warehouses has been selected after fifteen years' experience in various phases of the fruit industry—growing, marketing, manufacturing equipment and installing efficient mechanical systems.

There is no element of speculation need be considered when you purchase our equipment. We have searched the markets for the best obtainable and will only consent to act as distributor or manufacturers' agent when firmly convinced that our merchandise will be the BEST obtainable. We fully guarantee our machinery, equipment and installations, and we solicit the business of the practical fruit-grower who purchases equipment to save time, labor and money.

The Four W Picking Bag

A Revelation in Canvas Picking Bag Construction.

Built to give real service. Made of 12 oz. heavy duck; steel frame at opening shaped to body; canvas fastened to frame and made doubly secure by real leather binding. Straps made of heavy webbing and fastened to frame at points that assure complete rigidity at all times, and that allows the fruit picker absolute freedom of both hands and arms during the complete picking operation. Send for sample today or write for illustrated circular explaining the strong points of the "4W" Picking Bag.

Price $3.50

FOB Wenatchee, Wash.

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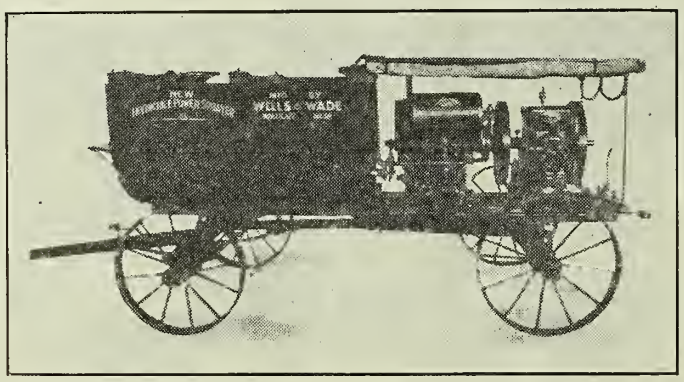
The "New Invincible" Power Sprayer



WE have been building Power Sprayers for the past five years. With fifteen years' experience in the fruit game our knowledge of what is required in a POWER SPRAYER is linked with the mechanical skill and inventive genius of our engineers, Messrs. Benson and Balch. Note this combination: Fairbanks-Morse Engine, with Bosch Magneto; Ward's "High Efficiency" Spray Pump; Patented Idler Gear (flexible); Benson Pressure Regulator; Hi-Speed "Vapo-Spray" Gun. RESPONSIBLE DEALERS IN FRUIT-GROWING DISTRICTS are now selling the "NEW INVINCIBLE."

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The Ewing Orchard Ladder

1—Manufactured of clear airplane spruce, air dried.

2—Each step properly supported by an ingenious metal fastener. Steps are further supported and ladder strengthened by bolt running under each step, clear thru ladder.

3—Bottom of ladder has sufficient spread to prevent tipping.

4—Ladder is strong enough to hold the heaviest man and will stand up season after season.

5 Ten-foot ladder only weighs thirty pounds.

6—Every size in stock for immediate shipment.

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The "Success" Box Press

Built with a view to eliminate the necessity of constant repair and, in many cases, the purchasing of a new press every other season, the "Success" Box Press meets the most exacting requirements of the fruit grower or organization.

Note the following features: 1—Extra heavy construction, insuring complete rigidity; fasteners placed on each side and back of press to which wheel or roller conveyor can be instantly attached allowing un-lidded and lidded boxes to be disposed of at the will of the pressman.

2—Metal arms and equalizer manufactured in one piece, and are adjustable, instantly, to apple, pear or other sized fruit boxes; equalizer fastens to upright bars of cold rolled shafting.

3—Patent clutch, with rigid dog and patent ratchet shift, makes the operation of the press swift and sure. This clutch overcomes all disagreeable features found in many presses. Pressmen in large packing houses are unanimous in declaring this press the fastest and most efficient on the market. Illustrations and complete specifications gladly mailed to any address.

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"Free Flow" Irrigation Valves

The ideal valves for irrigation. Made in single stream and bi-stream patterns. Allows free passage of water and easy access to standpipe to remove deposits of dirt. Does not clog, having an unobstructed waterway to discharge point. Illustrations and prices gladly mailed to any address.

In addition to the above mentioned equipment, fruit growers will no doubt be glad to know that we are distributors for Apple Box Elevators, Conveyors, "Parker 5-Run Nail Strippers," Dick Smith Nail Strippers, Clark Box Hatchets, Cooper Paper Needles, Clamp Box Trucks and Conveyors.

We are exclusive agents for the new Bird Fruit Grader, which has been pronounced the best fruit grader on earth.

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Observations On the Codling Moth in Walnuts

By H. J. Quayle, of the Citrus Experiment Station, Riverside, California
(A partial report of investigations in 1919)

THE codling moth (laspeyresia pomonella) has been known to attack the English or Persian walnut in California since 1909. In that year Mr. S. W. Foster of the United States Department of Agriculture observed it in the vicinity of Concord and published a bulletin on the subject. Five years later the writer received the first specimens from Santa Barbara County, and during the same year also from Orange County. While these seem to be the first actual records, no doubt the insect occurred in walnuts previous to that time.

In 1914 the infestation was very slight, only a fraction of a per cent in a few groves, but since that date there has been a marked increase in the amount of infestation, until in 1918 it suddenly reached the status of a serious pest. The Citrus Experiment Station at once decided to undertake studies looking toward the control of the pest. In the meantime the California Walnut Growers Association, through its manager, Mr. Carlyle Thorpe, realizing the importance of the problem, sponsored a bill which was passed by the California legislature, and which carried a sum of money for the investigation of the problem. This money was appropriated to the State Commission of Horticulture, now the State Department of Agriculture, and through the director, Mr. G. H. Hecke, one-half of the appropriation was generously turned over to the university for investigational work, and one-half retained by Mr. Hecke's office for work in connection with the prevention of spread of the pest.

Codling Moth in Walnuts Elsewhere

The codling moth attacks the walnut in South Africa, where it seems to have taken to the walnut at about the same time that the insect began to attack the walnut in California. Mr. C. W. Mally, entomologist at Cape Town, reports that in certain districts in 1915 as high as from 50 to 60 per cent of the crop was attacked. The codling moth also occurs in walnuts in France, where it has been known to attack the nuts as far back as 1859. It was first described as a distinct species having the scientific name of carpocapsa putamina, but later it was considered as a variety of the species pomonella, which attacks the apple. In correspondence with Mr. Carl Heinrich, of the Bureau of Entomology at Washington, Mr. Heinrich states that it is his opinion that the insect attacking the walnut in Europe is not a variety, but the same species that occurs in the apple in the United States.

Identity of the Species

A number of experiments were carried out for the purpose of determining how the insect would thrive when transferred from the apple to the walnut, and vice versa. Eggs, small larvæ, half-grown larvæ, and nearly matured larvæ which were secured from the apple were transferred to the walnut, and in all cases the insect went through its development in due course. Likewise, different stages of the larvæ were taken from the walnut and transferred to the apple with similar results. In cheesecloth cages the insect from the apple deposited eggs equally freely on the apple and walnut which were suspended in the same cage. Similar results were secured where the insects were taken from the walnut. A walnut tree was covered with cheesecloth and cocoons of the codling moth from the apple placed within the cheesecloth covering. Apples were suspended in the walnut tree, some of which were practically in contact with the nuts on the same tree. The moth deposited eggs on the walnuts under these conditions and the insect came to maturity.

From our experiments of the first season, then, the insect may be transformed from one food plant to another without affecting its development.

Under field conditions, however, the insect exercises more discrimination. Where walnut and apple foliage are interwoven, 90 per cent of the apples may be infested with not more than one per cent of the walnuts infested. This would be the situation in the area where the codling moth is known to infest walnuts. Outside of this area, apple and walnut foliage may be in contact without any record of the insect attacking the walnut.

Distribution

At the present time the areas where the codling moth infests walnuts, and where it is an economic problem, is in the vicinity of Santa Ana and Tustin, in the vicinity of Capistrano and Carpinteria. Occasional records of the insect in walnuts have been secured in several other localities. Mr. D. B. Mackie, who is in charge of the prevention of spread of the moth, has records from several localities where it has not yet reached the status of a pest.

Life History

The life history of the codling moth in walnuts is essentially the same as the life history of the same insect in the apple in the same locality. Until the present season it was supposed that the later broods only attacked the walnut.

In 1919 the first eggs were observed on the walnut in Santa Ana on May 8. These were located on the stem of the new wood, a short distance back of the nut, and also on the leaves. Like the apple, the walnut in the early stages has a fuzzy surface, which is not suitable for egg laying. The first larvæ appeared during the second week in May and continued to appear until the middle of July. The first brood of moths began to emerge on June 28 and continued until the last of August. The second brood of eggs was first observed July 7 and continued to appear until the first of September. Larvæ of the second brood began to appear about the middle of July, the maximum numbers occurring the last of July and the first of August. A third brood appeared later and larvæ were observed to enter the nuts up to the first of October.

The data as given are for the Santa Ana district. At Carpenteria, the life history is very different since the insect is three or four weeks later in making its appearance. The maximum number of larvæ entered nuts in that section last year about the middle of July, and these were larvæ of the first brood instead of the second brood, as at Santa Ana. The difference in temper-

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ature between Carpinteria and Santa Ana, while not very great, accounts for the difference in life history.

Feeding Habits

Many of the larvæ that appear early in the spring enter the nut at the calyx end, but after the nuts attain some size and are large enough to come into more or less contact, protection is afforded at this point, and for the remainder of the season most larvæ enter where two nuts are in contact. The nuts that are attacked early in the season, while they are still immature, fall to the ground, and these are not accounted for at harvest time. Up to the middle of July the larvæ as a rule bore directly toward the center of the nut. Up to this time the shell has not hardened to any extent. From the middle of July on, however, the shell is so hard that the larvæ can not make their way through the shell, and the only place they can enter the nut is through the suture at the base. They may enter the husk where two nuts are in contact as usual, but when the shell is reached they bore along the shell more or less at random. The majority of them sooner or later find the suture, where they enter and feed on the meat of the nut. Some that do not find the suture may complete their development in the husk of the nut alone.

Control

The control of the codling moth in walnuts must necessarily follow in general the methods that have been determined upon, after extensive investigation, in the case of the same insect in the apple. There are certain differences and difficulties, however, in the case of the walnut. The large size of the walnut trees presents greater difficulty in reaching all parts. There is no calyx cup to fill, as in the apple, and it is also necessary to get the poison where two nuts are in contact.

Banding

Burlap bands placed around the tree trunk serve as a place where larvæ repair to undergo pupation. While some of the worms enter here, there is not a sufficient number to afford satisfactory commercial control. Since after the first month or so the worms enter the band almost continuously it is necessary that the bands be removed and insects beneath killed, in order for the bands to be effective. To avoid the trouble of attending to the bands every couple of weeks the improved band, which was first used by E. H. Siegler in Colorado, was used. This consists of the ordinary burlap band, over which is placed twelve-mesh mosquito wire netting. This sort of a band allows the worms to enter through the meshes of the screen when they go under the burlap band to spin their cocoons as usual, but when the moth emerges it is unable to make its way out through the screen through which the larva entered. Hence such a band serves as a permanent trap. While these bands check a few of the insects there still may be a heavy percentage of infestation on the same tree.

Spraying

Spraying is the method of control generally relied upon for the codling moth in the apple and it proved to be satisfactory the past year in the control of the same insect in the walnut. A considerable amount of spray material is necessary to cover a tree, and this would seem to be a serious objection to spraying. An average sized walnut tree will require 25 gallons of spray to cover it thoroughly. The largest trees may require as much as 35 gallons. Good sized apple trees may be covered with eight or ten gallons, but the tree basis is not the proper way to make the comparison. While the walnut tree requires much more material there are fewer trees to the acre, so that on an acre basis there is not much difference between the amount of material needed for walnut and apple spraying. If a walnut tree requires 25 gallons and there are 20 trees to the acre, the amount of spray material per acre will be 500 gallons. If an apple tree requires eight gallons of spray and there are 60 trees to the acre the amount of material per acre will be 480 gallons.

Dusting

A large acreage was dusted during the past season (1919) for the codling moth, that is, arsenate of lead was applied dry rather than being mixed with water and used as a liquid. The dry material has been used with success in some sections on the apple. Dusting in the Santa Ana and Carpinteria sections has resulted in a considerable reduction of wormy nuts. The chief objection during the past year was due probably to lack of thoroughness in covering the tree. While the aphis is readily killed by the dust, in the case of the codling moth it is necessary to have the arsenical on every nut on the tree for good control. Another objection to the kind of dust that was used last year was the injury that resulted to the tree. The walnut tree is very susceptible to injury by spray materials, and hence only the most neutral materials can be used with safety.

Fortunately the objection of injury to the tree may be easily and completely overcome by using basic or neutral arsenate of lead, rather than the standard or acid arsenate of lead that was generally used during 1919. Where the writer employed the liquid spray, basic arsenate of lead was used with no injury whatever. Some of the second applications of dust also consisted of this material and no injury was done. Basic arsenate of lead is not as powerful a poison as the acid arsenate, hence is slower acting on the larvæ. In the case of the walnut, however, if the poison kills the larvæ eventually it would be satisfactory, because a small burrow in the husk alone will not affect the nut, whereas the same injury would mar the apple.

Time of Application

Based upon life-history studies of the codling moth in the walnut conducted last year, the first application should be made during the last week of May and the first week or two of June. The second application should be made about July 15. These dates are just previous to the time when the maximum number of larvæ of the two important broods enter the nuts. This applies to the Santa Ana district. At Carpinteria the time of appearance of the broods is strikingly different from that at Santa Ana. At Santa Ana the greatest injury is done by the summer brood in July and August, while at Carpinteria most injury is done by the spring brood in the latter half of July. There is, therefore, practically a full brood less at Carpinteria, and on this account one application ought to be sufficient. The time for making this application at Carpinteria would be the latter part of June or the first part of July.

Results of Dusting, 1919

A very complete survey of the area infested with the walnut codling moth was made as the nuts were harvested at Santa Ana, and also at Carpinteria. More than 200,000 nuts, representing some 5,000 pounds, were separately examined. Counts were made with each pick in most cases, and a reliable figure representing the percentage of infestation was secured from over 100 orchards, about one-half of which were dusted and one-half were not dusted.

TABLE I.—SURVEY OF SANTA ANA AREA.

	Per cent wormy
General average all orchards dusted....	4.73
General average orchards not dusted....	6.33
Highest pct. in single orchard dusted...	10
Highest pct. single orchard not dusted..	21.9
Lowest pct. single orchard dusted.....	.8
Lowest pct. single orchard not dusted..	.33

TABLE II.—SURVEY OF CARPINTERIA AREA

General average orchards dusted.....	4.2
General average orchards not dusted...	9.7
Highest pct. single orchard dusted.....	6.6
Highest pct. single orchard not dusted..	15.8
Lowest pct. single orchard dusted.....	.7
Lowest pct. single orchard not dusted..	.8

Referring to the figures given in Tables I and II, it is assumed that most of the heavily infested orchards were dusted. That was the case at least at Carpinteria. One orchard well toward the center of the infested area in that section, however, was left untreated and another not treated until very late. These two orchards, only, furnish the figures "9.7," for "not dusted," under Carpinteria. If counts were made just outside the infested district at Carpinteria they would show practically no infestation, whether dusted or not.

At Santa Ana, however, many orchards were not dusted that were distributed among the dusted orchards and were in general area of infestation. Approximately an equal number of determinations was made also between dusted and not dusted orchards, so that the figures should be fairly reliable.

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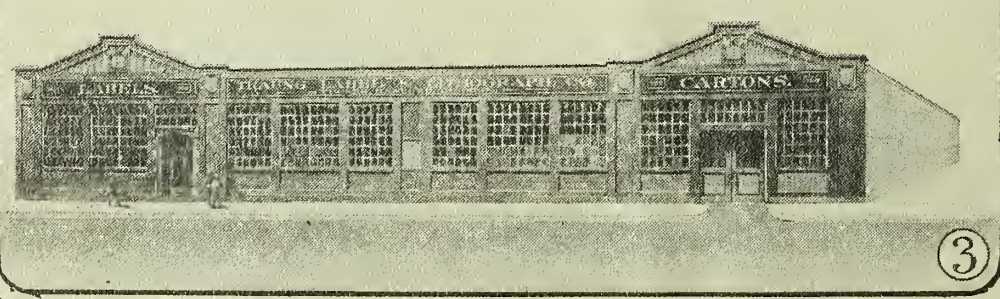

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Filbert Culture in County of Kent, England

By A. A. Quarnberg, Vancouver, Washington

LAST summer I made a trip to England for the purpose of studying filbert culture in a country where filberts have been successfully cultivated for centuries. The county of Kent, situated in the southeastern portion of the country is the principal filbert producing section of England, especially in the vicinity of Maidstone in the Medway Valley. In this country thousands of acres of land are devoted to filbert culture. I very much enjoyed my little daily excursions into the many different vigorous and systematically trained and pruned filbert orchards. These excursions gave me the opportunity and pleasure of meeting a number of the most prominent and successful growers and of discussing with them the various phases of filbert culture. Thereby I gained much valuable information concerning the practices in vogue.

The county of Kent has a mild and genial climate, much like that of the Pacific Northwest. The surface of the country is rolling. The soil is a gravelly loam with some chalk; it is generally well drained and fertile.

Judging from the flourishing condition of the vegetation generally, the climatic conditions seem to be favorable for the growing of filberts as well as other fruit common to that region.

In Kent, the filbert or cob nut is to a great extent grown in alternate rows with other species of fruit, such as apples, pears, and plums; the filbert trees usually being planted from 24 to 30 feet each way, making the distance between the trees in the mixed orchard from 12 to 15 feet apart. In these mixed orchards the filbert trees are pruned low and not allowed to grow more than six feet in height, while the other fruit trees are headed high and trained to a position above the low headed filbert trees. Often the apples, pears and plums form a dense cover over the cob nuts and yet the latter were said to bear well, though not so abundantly as in more open spaces.

In some of the older orchards, many of the standard fruit trees had died of old age and the cob nut trees occupied all the space. In such cases the filberts frequently had a spread of over 20 feet across the top, but still they were not allowed to grow over the standard six feet in height.

In favor of the mixed orchard it was claimed that the filberts and cob nuts would withstand considerable shade from other fruit trees and that generally some kind of a crop from the different varieties of fruit could reasonably be expected every year, so that by this method the land would produce a more regular income than when planted to filberts alone. Such was the case in 1919, when the cob nuts and filberts had a short crop while there was a good crop of cherries, apples, pears, plums, etc.

Cob nut and filbert trees planted alone in orchard form were usually set 12 to 20 feet apart, or somewhat closer than when interplanted with other fruit trees.

In spite of an occasional failure or short crop the Kent filbert growers seemed to have full confidence in the industry, claiming that the cob nuts and filberts, on the average, paid as well as fruit grown there, and, in my judgment, Kent certainly is a good fruit section.

While the filbert trees naturally did best on good land, it was claimed that the cob nuts and filberts were less exacting as to soil and that they would succeed on land quite unprofitable for various kinds of fruit. It was also said that rich and wet soils were expected to produce much wood and yet frequently yield less nuts.

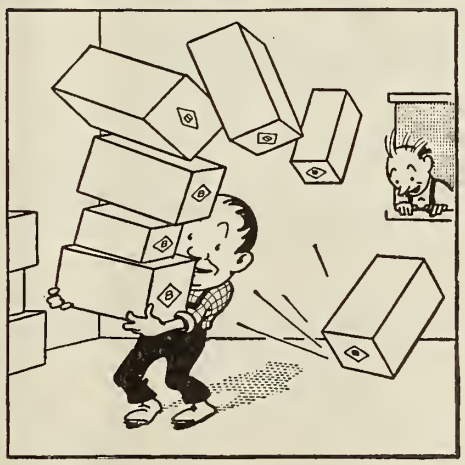
The variety of filbert most largely grown in Kent is the so-called Kentish cob, or Lambert, a variety with long husk and shape much resembling our Du Chilly, but probably a different strain of that type of nut. Regarding filbert and cob nuts, I will quote what a technical Kent filbert man says: "The old distinction between filberts and cob nuts was that the first-named had long husks or full beards, closing over the nuts, and the cob only a short one plainly showing the nut." This distinction has not been accurately retained and the Kentish cob is by that definition truly a filbert, but in Kent all the short-husked nuts are generally known as filberts and the long-husked nuts as cob nuts.

The Kentish cob is placed in the front rank of the so-called market nuts because it is a large, attractive and good-flavored dessert nut, and the tree is a strong grower with great bearing qualities.

There are quite a number of other varieties of filberts grown in Kent, but of the short-husked and roundish shaped nuts there were none which in my opinion, in all-round good qualities would compare with our Pacific Northwest grown Barcelona. But whether the Kentish cob, the chief nut in Kent, on the average, is a better nut than our Northwest Du Chilly, I am not prepared to say.

Concerning the question of pollination of the filbert, so important to us, I did not learn much in Kent, mainly because our own chief varieties, such as Du Chilly and Barcelona, are not grown there, and besides the growers generally did not seem to have the matter of filbert pollination fully systematized. Any imperfection in this respect may partly be explained by the circumstance that the Kentish cob, the variety chiefly grown there, to a great extent appears to be self-fertile, at least that seems to be the indication from the fact that large blocks of Kentish cob trees planted without any special provisions for cross-pollination, were said to be very productive. On the other hand one of the best authorities on filberts recommends the planting of one Cosford cob to every 25 trees of Kentish cob to insure good fertilization. The Cosford was said to be a better producer of catkins than the Kentish cob and itself a thin-shelled, good flavored nut. Another variety known as the Red Barcelona, and an enormous producer of catkins, was also reported to be used as a pollinizer, but its nuts were said to be small and of little commercial value.

A point considered of the greatest importance in connection with the cultivation of the filbert in Kent is the pruning of the trees. To see and study the close and systematic pruning of the filbert tree and its results was the main object of my visit. And now after having visited and examined a number of the Kent filbert orchards, it is my opinion that the thorough and systematic pruning which the growers are giving their trees undoubt-



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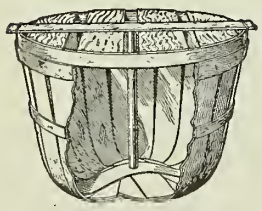

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edly is a strong factor in the success made of filbert culture there. By the thorough methods of pruning all the bearing wood of the trees is practically renewed every few years and the life and bearing period of the trees are prolonged almost indefinitely.

In the Beadle Brothers' orchard, near the city of Maidstone, I saw one of the oldest cob nut trees in the county. Its main stem was between two and three feet in diameter, one foot above ground, and the tree although more than 150 years old still appeared to be as strong and healthy as the surrounding trees fully 100 years younger.

I found the filbert growers nearly all agreed on the basin-shaped form of tree on a single stem from one to one and one-half feet high as the best for all purposes. Concerning the training and forming of the basin shape tree, W. F. Emptage, horticultural adviser and specialist, gives the following directions:

The newly planted trees are allowed to go without pruning one year, or until they are well established. The single stem is then cut back to a height of 12 to 15 inches to cause it to throw out shoots from the head to form the future tree. Four or five healthy strong shoots are allowed to grow, which in good ground they do rapidly. During the following winter the shoots are spread apart carefully and held in the form of a basin by a wooden hoop placed between the branches. These shoots are tied out around the hoop at equal distances and headed back in such a way that the terminal buds open outwards. These shoots are then allowed to grow and to put out new branches until about the fourth year when there will be 12 to 15 branches. The heads are kept broad, spreading and open by tying out the branches to stakes set in the ground, or otherwise, in order to get them into perfect shape. From these branches a set of spurs or shoots is given off on which the nuts are produced. To cause them to push out such spurs along their whole length, the main branches must be headed back more or less at every winter pruning.

According to E. A. Bunyard, one of the best authorities on filbert culture in Kent, after the base of the tree has been shaped to the proper form, pruning consists of breaking out the strong suckers which grow up in the center of the tree, cutting the strong leading shoots back, thinning the spurs, removing old wood, etc., the side shoots being best thinned after the flowers appear and the catkins have remained long enough to fertilize the pistilate flowers. And if time permits in July and August it was said that it was a great help to the strength of the tree to break the stronger shoots off the upper boughs with the finger and thumb. This operation plumps up the buds below the fracture and assists in ripening the wood. This method is found better than cutting as the broken surface allows some sap to exude, and tends to prevent the formation of secondary growth, which would weaken the tree, and be of no value in producing nuts. In winter

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pruning these broken ends are smoothly severed with a sharp knife or shears; and the pruner should so manage that there will always be an abundance of good young wood in the tree for fruiting purposes. When a twig shows signs of age the grower should prune so that a fresh young one will succeed it in the next year's cutting, so that worn-out twigs will never be seen in old trees. The trees should be so managed that at the end of 100 years they should be from 15 to 20 feet across the top but not higher than six feet from the ground.

It was also said that some fine nuts were produced on trees of pyramid form, 10 to 12 feet high, which have their spurs shortened, thinned, etc., in the same way as the basin-formed trees, gaining a few inches of upward extension annually.

The Kent filbert growers generally were well agreed on the necessity and great benefits of close and systematic pruning both for quality of nuts and for yield.

Filbert orchards in Kent are kept in good state of culture mainly by hand cultivation, such as forking, hoeing, etc. Some growers claimed that on account of the shallow feeding habits of the filbert tree, plowing would damage the roots. However that may be, the low-headed, spreading trees and the crowded condition of the orchards generally made the ordinary methods of cultivation hardly practicable or very inconvenient to say the least. Suckers were cleared out wherever they appeared.

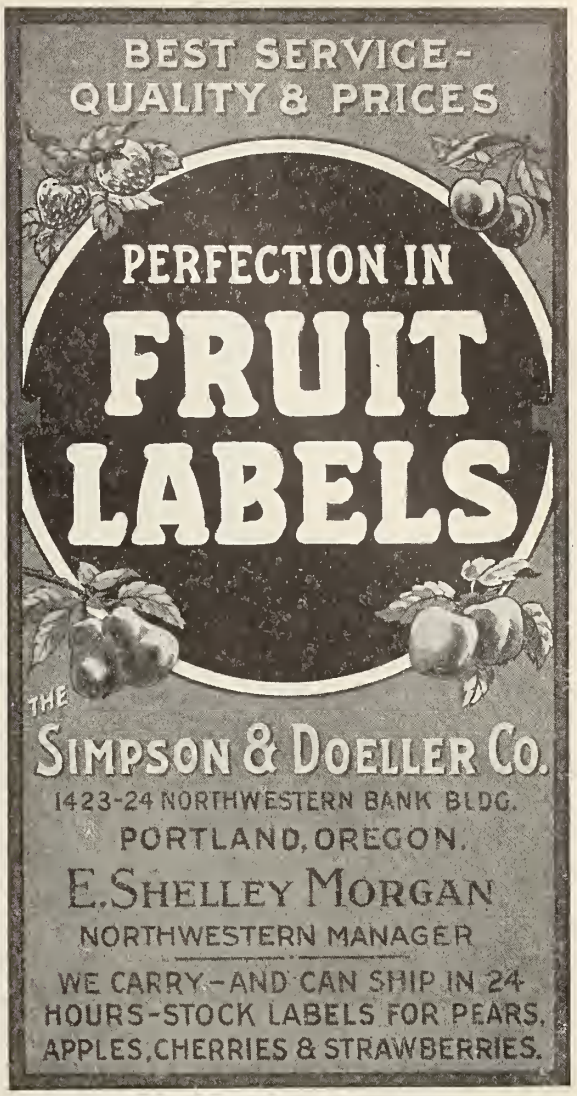
I was told that the Kent filbert orchards received a dressing of barnyard manure or other fertilizer whenever required to keep the trees in good bearing condition.

The Kent filbert orchards were comparatively free from disease and insect pests and I did not hear of any filbert blight there.

As to yields, it was said that one ton of filbert nuts has frequently been obtained from one acre, and as high a yield as two and one-half tons per acre has been recorded, but that was very exceptional. The owner of a 300-acre filbert plantation told me that he, in a long run of years, had, in round numbers, harvested from 300,000 to 500,000 pounds of nuts a year, or from 1000 to 1667 pounds per acre. This probably may be taken as a fair estimate of the average yield of the filbert orchards in Kent.

The cob nuts and filberts grown in Kent are cured and sold almost entirely in the husk, and for this purpose it was said that the nuts could be picked somewhat earlier than when husked.

I have briefly described some of the things which I saw and learned concerning filbert culture in Kent. The methods, practices and results obtained in the culture of the filbert there are certainly interesting and should be carefully studied and investigated by us with a view of adopting such of the methods and practices as may be thought beneficial and practical under existing conditions and circumstances in the Pacific Northwest.



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CONSULTING HORTICULTURIST

PROFESSOR W. S. THORNBER

Formerly
HEAD OF THE DEPARTMENT OF HORTICULTURE AND LANDSCAPE GARDENING
Later
DIRECTOR OF THE EXTENSION SERVICE
OF THE
STATE COLLEGE OF WASHINGTON

WILL ADVISE with fruit-growers upon all horticultural problems, including selection and preparation of orchard lands; propagation and care of nursery stock; planting and care of young orchards and small fruit plantations; the control of codling moth, San Jose scale, blight and other orchard pests; the preparation of lime-sulphur at home and the mixing of other sprays; economical orchard management; the irrigation and fertilization of orchard lands; the use of cover-crops and grass mulches; the pruning of fruit trees, shade trees, shrubs, bushes and vines; the renovation of old or neglected orchards, top-working or replacing of poor or unprofitable trees, and the examining and the working out of practical management plans for large orchards and orchard companies.

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